AD NUMBER
AD155261
CLASSIFICATION CHANGES
TO: **UNCLASSIFIED**
FROM: **CONFIDENTIAL**
LIMITATION CHANGES
TO: **Approved for public release; distribution is unlimited. Document partially illegible.**
FROM: **Distribution authorized to U.S. Gov't. agencies and their contractors; Administrative/Operational Use; SEP 1957. Other requests shall be referred to Department of the Army, Aberdeen Proving Ground, MD. Document partially illegible.**
AUTHORITY
USAMC ltr 24 Apr 1973 ; USAMC ltr 24 Apr 1973

AD _____

[redacted]

CONFIDENTIAL

ORDBG-1327--24 Oct 51

(4)

Aberdeen Proving Ground

MARYLAND

A TEST OF SALVO RIFLE MATERIAL (U)

THIS DOCUMENT CONSISTS OF ....180.... PAGES

COPY ....8.... OF ....16.... COPIES,

(D. A. PROJECT NO. 504-05-022)

DEVELOPMENT AND PROOF SERVICES

40 th Report OCO Project No. TS1-2

Regrading data cannot be predetermined

ARMY---OS---ABERDEEN PROVING GROUND, MD---415

TING THE
EANING
d 794.
IN
BY LAW.

CONFIDENTIAL

[redacted]

DEVELOPMENT AND PROOF SERVICES
ABERDEEN PROVING GROUND
MARYLAND

AUTHORITY: ORDDS (Carten) Teletype
ORD 3383

L.F.Moore/tsp
September 1957

A TEST OF SALVO RIFLE MATERIAL (U)

FORTIETH REPORT ON ORDNANCE CORPS PROJECT NO. TB1-2

DATES OF TEST: 25 APRIL - 9 SEPTEMBER 1957

ABSTRACT

OBJECTIVE

To obtain velocity, accuracy and penetration data on salvo rifle material.

SUMMARY

Four salvo weapons, ten rounds of ammunition, and an additional caliber .22 bullet were subjected to one or more of the following tests; accuracy, velocity, pressure, retardation in the armor vest, time-of-flight, and penetration in the M1 steel helmet and in ¼-inch steel plate.

CONCLUSIONS

Since the purpose of this test was to provide data for use in the study of a broad salvo program which includes both tactical as well as technical considerations, no conclusions are made.

RECOMMENDATIONS

None.

[redacted]

CONTENTS

[redacted]

I. INTRODUCTION

Several items of rifle material have been developed as a means for improving the effectiveness of ground troops in combat. Each of these items produces a number of projectiles with one movement of the trigger. It is desired to determine the velocity, accuracy and penetration characteristics of this material.

II. DESCRIPTION OF MATERIAL

A. Carbines, Caliber .22, M2 serial numbers 7149237 and 7195081 were used in this test. This weapon is a caliber .30, M2, carbine modified to use Cartridge, Ball, Caliber .22, Carbine. The original barrel has been replaced with one to use the caliber .22 round and the magazine has been altered. Also, a muzzle brake of a special design has been installed.

B. Carbine, Caliber .30, M2 serial number 7104206 was used as a control in the bench rest and automatic accuracy tests.

C. Rifles, Caliber .22, T48 serial numbers 1606 and 1909 were used in this test. This weapon is a caliber .30, T48 rifle modified to use Cartridge, Ball, Caliber .22 (unofficially called T48) with 68-grain bullet. The original barrel has been replaced and the magazine has been altered to use the caliber .22 round.

D. Rifle, Caliber .30, T48 serial number 4085 was used as a control in the benchrest and automatic accuracy tests.

E. Rifles, U.S., Caliber .30, M1, Modified, serial numbers 5973453 and 5977047 were used in testing the Duplex and Triplex rounds.

F. The shotgun used with the flechette ammunition was a Code A, 12-gage with a 28-inch modified barrel. The barrel was reinforced by the addition of four V-shaped sections of 1/16-inch material.

G. The following test weapons were employed:

1. Rifle, Code E, M70, Serial Number 304164 with a caliber .22 carbine test barrel assembled.

2. Rifle, U.S., M1903, Serial Number 4747051 with a caliber .22 test barrel assembled.

3. Rifle, U.S., M1903, Serial Number 1521616 with a caliber .30 accuracy test barrel assembled.

4. Rifle, Code E, M70, Serial Number 367368 with a caliber .27 test barrel assembled.

[redacted]

5. Rifle, Code E, M70, Serial Number 367844 with a caliber .25 test barrel assembled.

6. Rifle, Code E, M70, Serial Number 364827 with a caliber .22 test barrel assembled.

7. Rifle, U.S., M1903, Serial Number 1515142 with a caliber .30 accuracy test barrel assembled.

H. The following barrels were employed with universal receivers:

1. Barrel, pressure, caliber .22, carbine.

2. Barrel, pressure, caliber .30, number 3830.

I. Cartridge, Ball, Caliber .22, carbine uses a brass case, ball propellant, and a lead-core jacketed bullet. The average weight of five rounds selected at random was 132 grains, the average bullet weight was 41.1 grains, the average weight of the primed case was 75.0 grains, and the average weight of the propellant was 16.2 grains.

J. Cartridge, Ball, Caliber .22 (unofficially identified as T48) uses a brass case, ball propellant, and a lead-core jacketed bullet. The average weight of five rounds selected at random was 287 grains, the average bullet weight was 68.2 grains, the average weight of the primed case was 174.6 grains, and the average weight of the propellant was 44.2 grains.

K. Cartridge, Ball, Caliber .30, Duplex uses a brass case similar to the standard caliber .30 except that the neck has been lengthened 0.45 inch (overall length of the case is 2.94 inches). Ball propellant is used with two lead-core jacketed bullets. The average weight of five rounds selected at random was 445 grains, the average weight of the front bullet was 95.5 grains, the average weight of the rear bullet was 95.6 grains, the average weight of the propellant was 49.8 grains, and the average weight of the primed case was 204.5 grains. The base of the rear bullet is at an angle of four degrees with the normal to the axis. The base of both bullets is concave. The point of the rear bullet extends within the base of the front bullet when assembled in the case. The following information is printed on each 20-round cartridge box:

Cartridge, Ball, Cal..30 Duplex
(Controlled Dispersion)
Loading Date - May 1956
Contract No. DA-19-059-507-ORD-2374
Manufacturer: Code D.

L. Cartridge, Ball, Caliber .30, Triplex uses components similar to those in the Duplex round except for the projectiles. Three lead core jacketed bullets are used. The average weight of five rounds selected at random was 434 grains, the average weight of the front bullet was 59.5 grains, the average weight of the center bullet was 59.5 grains,

The average weight of the rear bullet was 59.7 grains, the average weight of the propellant was 52.4 grains, and the average weight of the primed case was 203.1 grains. The base of each bullet is concave. The point of the two rearmost bullets extends within the base of the forward bullet when assembled in the case. The following information is printed on each 20-round cartridge box:

Cartridge, Ball, Cal. .30 Triplex
Long Neck Case
WRA 1956 ORD 2381

M. Cartridge, AP, Caliber .30, T93E2, Lot LC 12010 was fired in the rifle, caliber .30, T48 which was used as a control.

N Cartridge, Ball, Carbine, Caliber .30, M1, Lot LC 513769 was fired in the carbine, caliber .30, M2, which was used as a control.

O. The following caliber .30 reference round was fired in the barrel, pressure, caliber .30, Number 3830:

Case: Caliber .30, Lot FAY 30-375 with Code F No. 8½ primer
Bullet: AP, M2, Lot FAY 30-374
Propellant: IMR 4895, Lot 2057, 48.5 grains.
Assessed values: Velocity 2716 fps
Pressure 45,900 psi

P. The flechette ammunition used in the 12 gage shotgun was assembled by Code B. It was identified by the Philadelphia Ordnance District as Shotgun Rounds, Type A-11, in accordance with AA Inc Drawing No. 1150-040001. Ten rounds were delivered on 4 June 1957 for the directed test. At a later date fifty rounds were delivered as instructed by Mr. Charles Dickey, Pitman Dunn Laboratory, Frankford Arsenal, for use in testing special target material by representatives of the Code C. Seven rounds of the 50 delivered for use in target testing were not used in that activity and they were made available for the directed test. The ten rounds provided for this test were fired in the velocity pattern and penetration test. One of the rounds from the latter delivery was broken down and the components inspected and weighed. The remaining rounds were fired to test instrumentation and in a penetration test at 200 yards. There was a slight difference in the ammunition in the two shipments. The rounds in the latter shipment had no wad over the front of the projectiles. The weight of the complete round was 717 grains. The weight of the components were as follows:

COMPONENT	WEIGHT (grains)
Flechettes (32 in number)	390.5
Plastic sabots (4)	56.5
Aluminum plug	40.5
First Wad	12.7
Second Wad	9.9
Propellant (flake type)	30.2
Primed case	176.3

The diameter of the body of the flechette was 0.087 inch. At a still later date 105 rounds were made available for helmet penetration tests at 300, 400 and 500 yards.

Q. The following additional rounds were used in the retardation test conducted with the armor vest. The rounds were fired with full and reduced charges.

1. Cartridge, Ball, Caliber .22, with 50-Grain Bullet, Lot 10LK4 uses a brass case, ball propellant, and a lead-core jacketed bullet. The average weight of five rounds selected at random was 271 grains, the average bullet weight was 50.3 grains, the average weight of the primed case was 173.2 grains, and the average weight of the propellant was 47.7 grains.

2. Cartridge, Ball, Caliber .25, with 75-Grain Bullet, Lot 74MC31 uses a brass case, ball propellant, and a lead-core jacketed bullet. The average weight of five rounds selected at random was 295 grains, the average bullet weight was 74.9 grains, the average weight of the primed case was 174.3 grains, and the average weight of the propellant was 46.4 grains.

3. Cartridge, Ball, Caliber .27, with 95-Grain Bullet, Lot 66LM62 uses a brass case, ball propellant, and a lead-core jacketed bullet. The average weight of five rounds selected at random was 314 grains, the average bullet weight was 95.2 grains, the average weight of the primed case was 174.0 grains, and the average weight of the propellant was 44.7 grains.

4. Cartridge, Ball, Caliber .30, M2, Lot FA 4310 uses a brass case, tubular propellant and a lead-core jacketed bullet. The average weight of the rounds selected at random was 399 grains, the average bullet weight was 150.1 grains, the average weight of the primed case was 199.0 grains, and the average weight of the propellant was 49.8 grains.

R. A lead-core jacketed bullet identified as a 50-Grain Full Patch Front Bullet for Caliber .22-06 Duplex Cartridge was loaded in the T48 case using the required charge of IMR No. 4895 propellant to give the desired velocities.

S. The body armor employed in the retardation test was identified as follows:

Armor Vest Overedged
W 44 Over
Att. Date 6 Oct. 1953
Phila. Q.M. Depot

III. DETAILS OF TEST

A. PROCEDURE

1. The various rounds were subjected to velocity and pressure tests where appropriate test weapons were available. Twenty rounds were fired in each test. The velocity was recorded at 78 feet from the muzzle by means of photoelectric screens and a counter chronograph. The pressure was determined by means of copper pressure cylinders (Drawing Number A-39436) and obturating cups (Drawing Number A-39435) with the appropriate tarage table

2. Simultaneous time-of-flight and remaining-velocity tests were conducted.

a. For the single-projectile ammunition, data were taken over ranges of 200, 400 and 600 yards with counter chronographs Caliber .30, Ball M2, (C_G = .227, 600-yard data) was used as control

b. For the duplex and triplex ammunition, data were taken over ranges of 100, 300 and 500 yards with the camera chronograph. Individual component velocities were recorded, using the same type of instrumentation as was used in obtaining velocities for multiple "darts", fired from shotgun shells, as described in the 36th Report on Project No TR1-2. In the "Duplex" firing on 22 and 23 May, the instrumental velocities at 25 ft. were not distinguished for the two components. Thereafter, they were distinguished. In the "Triplex" firing the instrumental velocities at 25 ft for the 2nd and 3rd component were not distinguished in any of the firing. In the 500-yard Triplex firing on 17 June a third lumiline screen was used at 60 ft., obtaining a second instrumental velocity at 35 ft. Components No. 2 and No. 3 still gave the same velocity (i.e. the velocity of component No. 3 was not detected). This was the last firing. It appeared that unless the velocity differences were on the order of 200 fps., the lumiline screens did not "load up" rapidly enough to record the velocity of a succeeding component. The times-of-flight and remaining velocities of the "Triplex" were so nearly the same (and over-lapped for some rounds) for the 2nd and 3rd components, that unless data for both components were obtained, it was not known which component was being measured.

Differences in times-of-flight, and similarity of ballistic coefficient, as indicated by shape and weight of the components, were taken as evidence that the velocity at 25 ft for the third component of the "Triplex" was not being detected. An approximate correction factor, to obtain the velocity of the 3rd component from that of the second was obtained as follows: Based on the 100-yard data, C_1 for the 1st component was .100 and for the 2nd, .096. Times were recorded by the camera chronograph, between 10 ft and 40 ft and between 40 ft and 290 ft of range. Velocities V_1 and V_2, (2614 and 2193 fps) corresponding to these two time intervals, were computed for the first component. V_1, over the

short time interval, was, as usual, considered applicable to the mid-point of the range interval (at 25 ft). From the velocities V_1 and V_2 and the ballistic coefficient, the corresponding range (149 ft) was computed. This determined the point of applicability of V_2 as being at 149 / 25 ft. This was taken to closely approximate the point of applicability of the corresponding velocity, V_2, for the 3rd component. Using the 1st-component ballistic coefficient as an approximation of that of the 3rd., the velocity at 25 ft for the 3rd component (V_1 = 2334 fps), was computed from the measured velocity V_2 = 19[illegible] fps and the range (149 ft as approximated above). This velocity, V_1 = 2334 fps, was 86 fps lower than that of the 2nd component (the mean observed 2nd velocity at 25 ft). The mean observed 2nd velocity at 25 ft was consequently "corrected" to 3rd-component velocity by a reduction of 86 fps in all data. The eleven rounds for which complete data were obtained, on 28 May over the 100-yard range, were used in determining the 86 fps correction factor.

3. The following accuracy tests were conducted:

a. Machine-rest accuracy tests were conducted at 100 and 300 yards. The targets were obtained simultaneously using the A target without backing material at the shorter range.

(1) Five ten-shot targets were obtained with each of the two types of caliber .22 cartridges with the appropriate accuracy test rifle assembled in a Rest, Recoil, Accuracy, Caliber .30, Carbine and mounted in a Frankford Arsenal machine rest using an appropriate "V" block.

(2) Four ten-round targets were obtained with each Duplex and Triplex caliber .30 rounds from each of two M1 rifles modified to use these special rounds. The rifle was assembled in Cradle, Universal, for Rifle Accuracy Firing and mounted in a Frankford Arsenal machine rest using an appropriate "V" block.

b. Bench-rest accuracy tests were conducted at 100 and 300 yards using the modified carbine and the modified T48 rifle. The targets at the two ranges were obtained simultaneously as in the machine-rest test. Five ten-round targets were fired from each weapon using the A target (with 10-inch bull's-eye) as an aiming point. One caliber .30 Carbine and one caliber .30 T48 rifle were fired for control.

c. An automatic accuracy test was conducted with the caliber .22 weapons using standard caliber .30 weapons as a control. Three shooters each fired ten three-shot bursts from each type weapon from both the prone and standing positions at 25 yards.

d. In the test described in paragraph 3A (2) above some of the shots failed to hit a 6 x 6-foot target at 100 yards when firing the Triplex round.

An additional test was conducted at a range of 50 yards to further establish the accuracy characteristics of this round. Four 10-round targets were fired from a bench rest using a 12 x 12-foot target with an A target in its center. The first shot in each round was identified by applying colored ink to the exposed bullet. The three shot holes for each round were also identified.

e. Additional accuracy tests were conducted to determine the cause for the poor accuracy obtained in firing the T48 caliber .22 round. Components of known quality were used as a control.

4. Penetration tests were conducted in steel helmets at 300 and 500 yards with each type of weapon.

5. Retardation tests were conducted on body armor with caliber .22, caliber .25, caliber .27 and caliber .30 rounds. The velocity for each round was calculated for ranges of 0, 140, 300 and 500 yards. Full and reduced charges were used to obtain the desired velocity levels for penetrating the vest at a range of 55 feet.

6. The flechette ammunition was fired in a modified 12 gage shotgun. Ten rounds were fired for velocity, pattern and penetration in M1 helmets. The velocity was recorded at 7 feet from the muzzle of the weapon by means of Lumiline screens and a counter chronograph. The screens were placed at a distance of 2 and 12 feet from the muzzle of the weapon. The pattern was recorded on a 6 x 6-foot Kraft paper target without backing material. Three rows of four M1 steel helmets and liners were placed at 100 yards for observation of penetration. Additional tests were conducted to determine penetration on M1 steel helmets at ranges of 200, 300, 400 and 500 yards.

7. A lead-core jacketed bullet identified as a 50-Grain Full Patch Front Bullet for Caliber .22-06 Duplex Cartridge was loaded in the T48 case using the required charge of DNR No. 4895 propellant to give the desired velocities. The round was subjected to time-of-flight, accuracy and penetration tests.

D. RESULTS

Function reports are attached as Appendix B and test data are attached as Appendix C. There follows a summary of results.

VELOCITY TEST

The velocity is given in feet per second at 78 feet.

	ROUND			
	CALIBER .22 CARBINE	CALIBER .22 T48	DUPLEX*	TRIPLEX*
Average	2867	3259	2446	2473
Maximum	2941	3303	2491	2564
Minimum	2825	322.	2393	2215
Extreme Variation	116	92	98	369
Mean Variation	18.5	24.2	22.7	107.4

PRESSURE TEST

The chamber pressure is given in pounds per square inch.

	ROUND		
	CALIBER .22 CARBINE	DUPLEX	TRIPLEX
Average	36690	52115	55125
Maximum	39500	55800	59000
Minimum	32600	47200	52100
Extreme Variation	6900	8500	6900
Mean Variation	1221	1480	1875

* Velocity recorded during pressure test (short-piston velocity). Velocity is for first bullet which passed over screen.

TIME-OF-FLIGHT AND REMAINING-VELOCITY TESTS

AMMUNITION TYPE	RANGE yds	DRAG FUNCTION	BALLISTIC COEFFICIENT: TIME OF FLIGHT DATA	BALLISTIC COEFFICIENT: REMAINING VELOCITY DATA	MEAN
Cal. .22, Carbine	200	GAPT9E4	.136	.132	.134
	400		.132	.131	.132
	600		.131	.128	.130
				Mean:	.132
Cal. .22, T43	200	G5	.215	.211	.213
	400		.223	.236	.230
	600		.234	.234	.234
				Mean:	.226
Cal. .22-06 Duplex (Front Bullet, Single fire)	200	G6	.108	.109	.109
	400		.113	.116	.115
	600		.116	.119	.118
				Mean:	.113
Cal. .30, Ball, M2 Lot FA-4332 (Control)	200	G6	.226	.221	.224
	400		.226	.226	.226
	600		.227	.229	.228
				Mean:	.226

			1st	2nd	1st	2nd	1st	2nd
Cal. .30 Duplex	100	G1	.160	.180	.161	.172	.160	.180
	300		.170	.174	.168	.168	.169	.171
	500		.168	.176	.174	.180	.171	.178
						Mean:	.167	.176

			1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Cal. .30, Triplex	100	G1	.100	.094	.096	.100	.088	.091	.100	.091	.094
	300		.100	.088	.087	.101	.093	.087	.101	.090	.088
	*500		.112	.110	.095	.103	.093	.093	.108	.102	.094
								Mean:	.101	.091	.091

*Based on one (1) round only, and excluded from mean.

Data for Standard Meteorological conditions are tabulated below. Muzzle velocities are based on mean observed instrumental velocities. For the single-projectile type ammunition, the mean ballistic coefficient obtained from the observed data, was used for the 200, 400, and 600-yard ranges. The 300 and 500 yard values were obtained by linear interpolation. For the duplex and triplex ammunition, the mean ballistic coefficient was used for all ranges (the mean of the values obtained from the 100, 300 and 500-yard observed data).

RANGE yds	BALLISTIC COEFFICIENT	REMAINING VELOCITY, fps	MAXIMUM ORDINATE, ft	ELEVATION min
		Cal. .22 Carbine		
0 $C_{AP-T9E4}$:	.134	2981		
100	.134	2431	.1	2.3
200	.134	1939	.3	5.0
300	.133	1505	.7	9.0
400	.132	1157	1.8	14.8
500	.131	989	3.6	23.4
600	.130	882	6.5	35.0
		Cal. .22, T48		
0 C_5:	.213	3314		
100	.213	3030	.0	1.7
200	.213	2756	.2	3.4
300	.221	2520	.4	5.4
400	.230	2312	.8	7.8
500	.232	2092	1.3	10.3
600	.234	1885	2.1	13.3
		Cal. .22-06 Duplex (Front bullet)		
0 C_6:	.109	3543		
100	.109	3086	.0	1.5
200	.109	2630	.2	3.2
300	.112	2213	.4	5.3
400	.115	1837	.9	8.0
500	.116	1483	1.7	11.6
600	.118	1200	3.0	16.2

RANGE yds	BALLISTIC COEFFICIENT	REMAINING VELOCITY, fps	MAXIMUM ORDINATE, ft	ELEVATION min
	Cal. .30 Ball, M2, (Lot No. FA 4332) Control			
0	C_6: .224	2702		
100	.224	2479	.1	2.6
200	.224	2259	.2	5.2
300	.225	2047	.6	8.3
400	.226	1845	1.2	11.7
500	.227	1655	2.0	15.8
600	.228	1478	3.3	20.4
	Cal. .30 Duplex 1st Component			
0	C_1: .167	2512		
100	.167	2015	.1	3.0
200	.167	1584	.4	7.2
300	.167	1246	1.1	13.1
400	.167	1039	2.5	21.4
500	.167	925	4.8	32.4
600	.167	843	8.3	46.3
	Cal. .30 Duplex 2nd Component			
0	C_1: .176	2354		
100	.176	1904	.1	3.4
200	.176	1515	.4	8.1
300	.176	1214	1.2	14.6
400	.176	1031	2.7	23.4
500	.176	925	5.1	35.0
600	.176	848	8.6	49.1
	Cal. .30 Triplex 1st Component			
0	C_1: .101	2678		
100	.101	1867	.1	3.0
200	.101	1257	.4	8.0
300	.101	965	1.5	16.8
400	.101	827	3.6	30.0
500	.101	725	7.2	47.7
600	.101	640	12.8	70.1

RANGE yds	BALLISTIC COEFFICIENT	REMAINING VELOCITY, fps	MAXIMUM ORDINATE, ft	ELEVATION min
		(Cal. .30 Triplex) 2nd Component		
0	C_1: .091	2556		
100	.091	1693	.1	3.4
200	.091	1117	.5	9.6
300	.091	893	1.8	20.4
400	.091	765	4.3	36.3
500	.091	665	8.6	57.3
600	.091	581	15.2	83.4
		3rd Component		
0	C_1: .091	2495		
100	.091	1646	.1	3.5
200	.091	1095	.6	10.1
300	.091	883	1.9	21.4
400	.091	758	4.5	37.7
500	.091	660	8.8	59.0
600	.091	575	15.7	85.2

ACCURACY TESTS

MACHINE-REST ACCURACY

The averages for five ten-shot targets from each test weapon are given in inches.

ROUND	MR	MVD	MED	EVD	RMD	RS
100-Yard Targets						
Caliber .22 Carbine	0.6	0.4	0.3	1.5	1.4	1.8
Caliber .22 T48	2.0	1.0	1.5	4.2	6.4	6.8
300-Yard Targets						
Caliber .22 Carbine	1.8	1.2	1.1	4.8	4.3	5.6
Caliber .22 T48	6.0	3.2	4.4	13.1	19.3	20.4

The averages for four ten-round targets from each rifle are given in inches.

FIRST SHOTS						ALL SHOTS			
MR	MVD	MED	EVD	RMD	RS	MR*	EVD	RMD	RS
DUPLEX ROUND									
100-Yard Targets									
Rifle No. 5973453									
1.8	1.2	1.9	5.9	4.1	6.6	10.8	19.3	18.6	20.8
Rifle No. 5977047									
2.0	1.5	1.0	5.3	4.0	6.2	8.4	19.2	15.0	19.7
Average									
1.9	1.35	1.0	5.6	4.05	6.4	9.6	19.25	16.8	20.25
300-Yard Targets									
Rifle No. 5973453									
5.9	4.3	3.1	18.4	12.2	19.8	31.6	56.4	56.9	63.4
Rifle No. 5977047									
6.0	4.6	2.9	17.4	11.8	19.4	25.0	56.8	45.8	59.2
Average									
5.95	4.45	3.0	17.9	12.0	19.6	28.3	56.6	51.35	61.3

* From the center of impact of the first shot in each round.

FIRST SHOTS						ALL SHOTS			
MR	MVD	MHD	EVD	EHD	ES	MR	EVD	EHD	ES

TRIPLEX ROUND

100-Yard Targets

Rifle No. 5973453
6 Shots missed target* — 12 shots missed target*

Rifle No. 5977047
3 shots missed target* — 6 shots missed target*

300-Yard Targets

Rifle No. 5973453
5 shots missed target** — 13 shots missed target**

Rifle No. 5977047
5 shots missed target** — 6 shots missed target**

* A 6 x 6-foot target was used at 100 yards
** A 15 x 15-foot target was used at 300 yards.

SPECIAL TEST OF CARTRIDGE, BALL, CALIBER .22, T48

TO DETERMINE CAUSE FOR POOR ACCURACY

Average measurements for ten-shot machine-rest targets fired at a range of 100 yards are given in inches.

NO. OF TARGETS	MR	MVD	MHD	EVD	EHD	ES
Cartridge, Ball, Caliber .22, T48 with the original bullet replaced with one of 68-grain of the same design but from a different lot.						
4	0.8	0.5	0.5	2.3	1.8	2.4
Cartridge, Ball, Caliber .22, handloaded with bullet removed from T48 round, 42 grains 4350 propellant, and WCC-9 primer.						
4	1.1	0.8	0.6	3.0	2.9	3.7
Cartridge, Ball, Caliber .22, handloaded with a 68-grain bullet, 42 grains 4350 propellant, and WCC-9 primer.						
2	0.5	0.4	0.2	1.4	1.1	1.7
Cartridge, Ball, Caliber .22, handloaded with propellant removed from the T48 round, WCC-9 primer, and a 68-grain bullet.						
2	1.0	0.6	0.8	2.3	2.8	3.2

TEST OF 50-GRAIN FULL PATCH BULLET FOR CALIBER

.22-06 DUPLEX CARTRIDGE AND 37.0 GRAINS OF IMR 4895 PROPELLANT

Average measurements for four ten-shot machine rest groups fired at a range of 100 yards are given in inches.

MR	MVD	MHD	EVD	EHD	ES
0.8	0.6	0.6	2.1	2.1	3.4

BENCH-REST ACCURACY

The averages for five ten-shot targets from each test weapon are given in inches.

WEAPON	MR	MVD	MHD	EVD	EHD	aS
			100-Yard Targets			
Caliber .22 Carbine No. 7149237	1.3	0.9	0.8	3.5	3.0	4.2
Caliber .22 Carbine No. 7195081	1.5	1.0	1.0	4.1	4.2	5.1
Average	1.4	0.95	0.9	3.8	3.6	4.65
Caliber .30 Carbine No. 7104206	2.1	1.7	0.9	6.2	4.0	6.6
Caliber .22 T48 No. 1616	2.5	1.6	1.6	6.4	6.5	7.7
Caliber .22 T48 No. 1909	7.2	4.9	4.6	15.7	14.4	19.1
Average	4.85	3.25	3.1	11.05	10.45	13.4
Caliber .30 T48 No. 4085	3.2	1.8	2.2	8.2	8.1	9.7
Caliber .22 Carbine No. 7149237	4.4	2.7	2.9	11.5	10.9	13.8
Caliber .22 Carbine No. 7195081	5.0	3.3	3.2	13.0	13.1	16.3
Average	4.7	3.0	3.05	12.25	12.0	15.05
Caliber .30 Carbine No. 7104206	7.1	5.9	2.9	21.4	13.3	22.0
Caliber .22 T48 No. 1616	7.5	4.9	4.8	18.6	19.9	23.3
Caliber .22 T48 No. 1909	21.4	14.0	14.2	44.7	43.9	56.1
	14.45	9.45	9.5	31.65	31.9	39.7
Caliber .30 T48 No. 4085	9.6	5.1	6.9	23.4	24.6	29.0

BENCH-REST ACCURACY TEST OF TRIPLEX ROUND

The averages for four ten-round targets fired at a range of 50 yards are given in inches.

FIRST SHOTS						ALL SHOTS			
MR	MVD	MHD	EVD	EHD	ES	MR*	EVD	EHD	ES
8.1	6.8	3.5	37.2	17.6	38.6	7.6	40.6	28.3	43.8

* From the center of impact of the first shot in each round.

AUTOMATIC ACCURACY

The mean distance of the two automatically-fired shots in each three-round burst from the center of impact of the first shots is given in inches. Each figure is an average for ten three-round bursts fired by each of three shooters at 25 yards.

WEAPON	POSITION	
	PRONE	STANDING
Caliber .30 Carbine	41.8	70.7
Caliber .22 Carbine	19.9	19.3
Caliber .30 T48	29.9	101.4
Caliber .22 T48	16.0	28.2

PENETRATION*

CARTRIDGE	RANGE(yds)	NUMBER OF FAIR HITS	RESULTS
Helmet, Soldier, Steel, M1 with Liner			
Caliber .22 Carbine	300	5	All bullets gave complete perforations in one side of helmet and liner.
	400	5	All bullets failed to penetrate helmet.
Caliber .22 T48	500	5	All bullets gave complete perforations in both sides of helmet and liner.
Caliber .30 Duplex	300	5	Two first bullets which hit helmet gave complete perforations in one side of helmet and both sides of liner. Three second bullets which hit helmet failed to penetrate.
	400	5	Of four first bullets which hit helmet, one gave a complete perforation in one side of helmet and liner, and three failed to penetrate. One second bullet which hit helmet gave a complete penetration in one side of helmet and liner.
Caliber .30 Triplex	100	7	Of six second or third bullets which hit helmet, five gave complete perforations in both sides of helmet and liner and one gave a complete perforation in one side of helmet and both sides of liner. One first bullet which struck helmet gave a complete perforation in both sides of helmet and liner.
	200	5	Two first bullets and three second or third bullets which hit helmet failed to penetrate.
Caliber .22-06 Duplex (front bullet)	600	5	Of five bullets which hit helmet, four failed to penetrate and one gave a complete perforation in one side of the helmet and liner.

*Definitions for various types of penetrations are given in the penetration test data included in Appendix C.

PENETRATION*

CARTRIDGE	RANGE (yds)	NUMBER OF HAIR HITS	RESULTS
	Plate, Steel, Homogeneous, 1/4-inch		
Caliber .22 Carbine	100	5	All bullets failed to penetrate.
Caliber .30 Duplex	100	9	All bullets failed to penetrate.
Caliber .30 Triplex	100	5	All bullets failed to penetrate.
Caliber .30-06 Duplex (front bullet)	200	5	Four bullets gave complete perforations and one bullet failed to penetrate.

* Definitions for various types of penetrations are given in the penetration test data included in Appendix C.

RETARDATION TEST

The retardation in perforating the armor vest is an average for five rounds unless otherwise indicated.

RANGE (yds)	CALCULATED VELOCITY FOR RANGE (fps)	VELOCITY OBTAINED (fps)	RETARDATION (fps)
Cartridge, Ball, Caliber .22, Carbine			
0	2981	2955	18
140	2227	2204	27
300	1523	1561	52
500	985	947	*

* Bullets perforated armor vest but velocity was not recorded.

Cartridge, Ball, Caliber .22, T48

0	3314	3318	6
140	2919	3015	16
300	2550	2777	15
500	2092	2326	20

Cartridge, Ball, Caliber, .22 with 50-Grain Bullet

0	3795	3842	21
140	3205	3382	28
300	2554	2644	35
500	1811	1689	41

RETARDATION TEST

The retardation in perforating the armor vest is an average for five rounds unless otherwise indicated.

RANGE (yds)	CALCULATED VELOCITY FOR RANGE (fps)	VELOCITY OBTAINED (fps)	RETARDATION (fps)
Cartridge, Ball, Caliber .22 hand-loaded with 50-Grain Full Patch Front Bullet for the Caliber .22-06 Duplex Cartridge.			
0	3543	3590	42
140	2904	2853	42
300	2213	2058	48
500	1483	1651	61
Cartridge, Ball, Caliber .25 with 75-Grain Bullet			
0	3374	3444	24
140	2850	2935	40
300	2272	2222	32
500	1650	1601	40
Cartridge, Ball, Caliber .27 with 95-Grain Bullet			
0	3143	3141	12
140	2699	2774	17
300	2203	2329	18
500	1650	1697	40
Cartridge, Ball, Caliber .30, M2			
0	2641	2768	9
140	2336	2359	12
300	1998	2000	17
500	1607	1544	28
Cartridge, Ball, Caliber .30, Duplex			
	First Bullet		
0	2511	2537	46
140	1838	1840	48
300	1266	1255	74
500	941	1022	66*
	Second Bullet		
0	2354	2340	38
140	1727	1690	54
300	1198	1159	84
500	933	1026	83

* Figures from retest.

RETARDATION TEST

RANGE (yds)	CALCULATED VELOCITY FOR RANGE (fps)	VELOCITY OBTAINED (fps)	RETARDATION (fps)
Cartridge, Ball, Caliber .30, Triplex			
	First Bullet		
0	2679	2600	64
140	1586	1539	82
300	961	1141	109
500	722	941	135
	Second Bullet		
0	2553	2515	88
140	1445	1420	111
300	909	1165	148
500	682	799*	253*
	Third Bullet		
0	2495	2428	86
140	1381	1293**	105**
300	885	1064*	145*
500	662	--	--

* Figures are for one round only.
** Figures are for three rounds only.

TEST OF FLECHETTE AMMUNITION

VELOCITY

The velocity is given in feet per second at 7 feet.

AVERAGE	1258
MAXIMUM	1316
MINIMUM	1205
EXTREME VARIATION	111
MEAN VARIATION	28.3

PATTERN

Fifty-two percent of the projectiles impacted in a 30-inch circle at 40 yards.

PENETRATION*

The projectile perforated one side of the M1 steel helmet and liner at 300 yards and it gave a complete penetration in one side of the helmet and liner at 500 yards.

* Definitions for various types of penetration are given in the penetration test data included in Appendix C.

IV. OBSERVATIONS

A. ORDTS Carten TT ORD 3383 gave general test requirements. More detailed requirements were given in a telephone conversation on 26 February 1957 by Mr. Bonkemeyer. He requested that the following tests be conducted using a minimum number of weapons of each type:

1. Pressure.

2. Velocity at muzzle, 300 and 500 yards.

3. Maximum ordinate at 300 and 500 yards.

4 Accuracy at 100 and 300 yards.

5. Penetration in steel helmets at 300 and 500 yards.

B. In a telephone conversation on 10 May 1957 Mr. Bonkemeyer advised that additional test data were required by the Ballistic Research Laboratories and that authorization to conduct this work is contained in ORDTS Bonkemeyer TT ORD 7771. Mr. Donald Hall, BRL, on 10 May 1957, directed that the following additional tests be conducted:

1. Determine the velocity of each projectile in a Duplex and Triplex round at ranges of 0, 140, 300 and 500 yards.

2 Determine the remaining velocity as well as the initial velocity of caliber .22, caliber .25, caliber .27 and caliber .30 rounds, as well as Duplex and Triplex rounds, in the penetration of body armor at ranges of 0, 140, 300 and 500 yards.

3. Determine the point at which the Duplex and Triplex rounds will perforate the steel helmet and 1/4-inch steel plate.

C. Mr. W. C. Benjamin, Jr., BRL, on 9 July requested that tests be conducted using a caliber .22, 50-grain bullet. It was requested that the bullet be loaded in an appropriate case to give a muzzle velocity of 3500 feet per second, and that time-of-flight, accuracy, penetration and retardation (in armor vests) tests be conducted.

D. Several tests were limited by the availability of appropriate test weapons and ammunition.

E. Experienced riflemen were employed in this test.

1. Davis, age 30 is five feet nine inches in height and weighs 180 pounds. He has had five years of experience at this station as a civilian gunner. He holds the rating of "master" in National Rifle Association small-bore rifle competitions.

Kirkout, age 59, is six feet in height and weighs 200 pounds. He has had 34 years of experience in competitive rifle and pistol shooting. He is a master sergeant on active duty in the Army. He holds the rating of "expert" in National Rifle Association high-power rifle competitions.

3. Moore, age 43, is six feet one inch in height and weighs 180 pounds. He has had considerable experience in firing various types of weapons and holds the rating of "master" in various types of National Rifle Association rifle competitions.

4. Valentini, age 28, is five feet nine inches in height and weighs 140 pounds. He has had two years of experience in high-power rifle competitions and holds the rating of "master" in National Rifle Association high-power rifle competitions.

F. Cartridge, Ball, Caliber .22, T48 gave poor accuracy in this test. In a previous test (results are contained in the Fifty-Second Report on Ordnance Corps Project No. T32-2015) handloaded rounds using resized cases, 42 grains of 4350 propellant, and a 68-grain bullet gave an average mean radius and extreme spread of 0.29 and 0.90 inch respectively when fired at a range of 100 yards from a test weapon mounted in a machine rest. In this test the T48 round gave an average mean radius and extreme spread of 2.0 and 6.8 inches, respectively, when fired under similar conditions. Additional firing was conducted to determine, if possible, which component was responsible for the low level of accuracy. The test results show that the bullet contributed largely to the poor accuracy although the propellant also appeared to affect the accuracy adversely. When removed from the case with an inertia-type bullet puller, it was observed that the T48 bullet was deformed somewhat at the rear of the cannelure.

G. It was expected that considerable retardation would occur when the various bullets perforated the armor vest. Therefore, the screens for recording the bullet's velocity on the far side of the vest were placed close to the vest and ten feet apart in order to obtain a high probability of the bullet passing over the screens. This arrangement was desirable from the viewpoint of recording a large percentage of the velocities after the bullet passed through the vest. However, an appreciable error was introduced in the velocities recorded because of the short distance between the screens. For this reason, the retardation figures are somewhat inconsistent. Since five rounds were fired for each condition the average figure approximates the retardation. A retest was fired using the first Duplex bullet and a charge of 7.0 grains of propellant since the retardation figure in the original test was several times that obtained with the second Duplex bullet at a similar velocity. The retest gave a retardation figure comparable with that for the second bullet. Therefore, an error in instrumentation is suspected in the original test.

H. The caliber .30 Duplex round gave a pattern which had several well-defined characteristics. In the accuracy tests the exposed bullet on each round was coated with ink having a distinctive color so that its impact on the target could be identified. It was observed that the first bullets in each round made a group which is comparable in size to that obtained from a standard M1 rifle when using ammunition of average quality. The second bullet in each round generally impacted above the first bullets as shown in photograph P25262 included in Appendix D.

I. The caliber .30 Triplex round had no well-defined accuracy characteristics as did the Duplex. In firing the Triplex at a range of 100 yards a number of shots missed a 6 x 6-foot target. An additional test was conducted at 50 yards in order to determine the accuracy. In the 50-yard test, which was fired from a bench rest by an expert rifleman, the first bullet was identified as described previously. Also, the holes made by the three bullets in a single round were identified by marking after firing each round. Therefore, the location of the impact of the first bullet, as well as the pattern of each round, could be observed. Photograph B26047 demonstrates that the first bullet may be an extreme shot in the group. The size of the pattern made with each round varies greatly.

V. CONCLUSIONS

Since the purpose of this test was to provide data for use in the study of a broad salvo program which includes both tactical as well as technical considerations, no conclusions are made.

VI. RECOMMENDATIONS

None

SUBMITTED:

L. F. MOORE
Ordnance Engineer

REVIEWED:

WILLIAM C. DAVIS
Chief, Small Arms and
Aircraft Weapons Branch

CLAUDE E. BROWN
Chief, Infantry and Aircraft
Weapons Division

APPROVED:

H. A. NOBLE
Assistant to the Deputy Director
for Engineering Testing
Development and Proof Services

REFERENCES

1. Firing Record No. S-46256, To Conduct Velocity, Pressure, Accuracy and Penetration Tests on Caliber .22, .25 and .27 Ammunition.

2. Fifty-Second Report on Project No. TS2-2015 titled "A Test of Rifle, Caliber .30, Armalite".

3. Thirty-Sixth Report on Project No. TS1-2 titles "A Test of Flechette-Loaded Small Arms Ammunition".

APPENDICES

APPENDIX A

FILE ----------474.1/
472/
DATE----------14 FEB. 57

ACTION----------D & PS

INFO----------

ET011

1957 FEB 14

EUA336

PP RUETGH

DE RUEPC 86H

P 132130Z

FM COFORD DA WASHDC

TO CG ABERDEEN PG MD

DA GRNC

BT

FROM ORDTB CARTER T' ORD3383

FOREGOOM CARTER-DAVIS, REQUEST EVALUATION TEST BE CONDUCTED EMPLOYING SALVO RIFLE MATERIEL FORWARDED YOUR STATION FROM FORT BENNING. TESTS SHOULD INCLUDE VELOCITY, ACCURACY, AS WELL AS HELMET PENETRATION AT 300 AND 500 YARDS. COST CHARGEABLE TO PROJECT TS1-2.

BT

CFM ORD3383 300 500 TS1-2

13/2202Z

[redacted]

FILE----------OOO /

DATE----------13 MAY 57

ACTION----------D & P

INFO----------D/C

info----------p---MOD

1957 MAY 13

[redacted]

FP [redacted]

[redacted]

P [redacted]

FM [redacted]

TO [redacted]

[redacted]

BT

FOR ORDPG DAPS MOORE FROM ORDIB

BONKEMEYER TT ORD7771

FONECON BONKEMEYER-MOORE RE TT 3383 DTD 13 FEB 57 FIRING PROGRAM SHOULD NOT BE RESTRICTED TO SALVO MATERIEL ONLY. OTHER WEAPONS AND AMMUNITION AS NECESSARY TO SUPPLY COMPLETE INFORMATION SHOULD BE INCLUDED IN THIS PROGRAM

BT

CFM ORD7771 3383 13 57

1Ø/2Ø29Z

APPENDIX B

LEGEND

A - Automatic.

S - Semiautomatic.

FF - Failure to feed.

FE - Failure to eject.

FX - Failure to extract.

SS - Single shot.

BOB - Bolt over-rode base of round in feeding from magazine.

BUB - Bolt under-rode base of round in feeding from magazine.

CRE - Complete round ejected.

RCB - Round caught on rear of barrel.

SAT - Satisfactory.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Carbine, Caliber .22, M2, Serial Number 7149237. Weight of carbine with empty magazine 5.78 lbs. Average trigger pull 6.6 lbs.			
		Cartridge, Ball, Caliber .22, Carbine.			

AUTOMATIC ACCURACY TEST

Procedure called for firing in three-round bursts.

30 April 1957

	Rifleman: Davis			Position: Prone	
	3	3	S	SAT	Sighting shots.
1310	45	48	A	1 - CRE	Ten interrupted bursts
				2 - FJ	due to malfunctions.
				3 - BOB	
				4 - FF	
	10	58	A	SAT	Functioning burst.
	Rifleman: Moore			Position: Prone	
1436	6	64	A	1 - BOB	
				2 - RCB	

Seven magazines were used in an effort to obtain satisfactory functioning. The weapon was removed from this test due to excessive malfunctions.

BENCH-REST ACCURACY TEST

Targets were obtained at 100 and 300 yards simultaneously.

7 May 1957

	Rifleman: Davis				
	3	67	S	SAT	Fouling shots.
0950	10	77	S	SAT	
1008	10	87	S	SAT	
1027	10	97	S	2 - FX	
	Rifleman: Valentini				
1056	10	107	S	SAT	
1112	10	117	S	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
					Carbine, Caliber .22, M2, Serial Number 719508
					Weight of carbine with empty magazine 5.75lbs
					Average trigger pull 5.9 lbs
					Cartridge, Ball, Caliber .22, Carbine

AUTOMATIC ACCURACY TEST

Procedure called for firing in three-round bursts.

30 April 1957

	10	10	A	SAT	Functioning burst.
	3	13	SS	SAT	Sighting shots fired by Davis.
	Rifleman:	Moore			Position: Prone
1507	30	43	A	SAT	

1 May 1957

	Rifleman:	Girkout			Position: Prone
	3	46	A	SAT	Fouling shots.
0911	31	77	A	1-FF	One interrupted burst due to malfunction.
	Rifleman:	Girkout			Position: Standing
1100	30	107	A	SAT	
	Rifleman:	Moore			Position: Standing
1240	31	138	A	1-FX	One interrupted burst due to malfunction.
	Rifleman:	Davis			Position: Standing
1325	32	170	A	2-FX	Two interrupted bursts due to malfunctions.

BENCH-REST ACCURACY TEST

Targets were obtained at 100 and 300 yards simultaneously.

7 May 1957

	Rifleman:	Valentini			
	3	173	S	SAT	Fouling shots
1003	10	183	S	SAT	
1015	10	193	S	SAT	
1030	10	203	S	1-FX	
	Rifleman:	Davis			
1045	10	213	S	1-FX	
1105	10	223	S	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Carbine, Caliber .30, M2, Serial Number 7104206 Weight of carbine with empty magazine 5.72 lbs Average trigger pull 7.1 lbs			
		Cartridge, Ball, Carbine, Caliber .30, M1, Lot LC-613769			
		AUTOMATIC ACCURACY TEST			
		Procedure called for firing in three-round bursts.			
		30 April 1957			
	3	3	S	SAT	Sighting shots fired by Davis.
	Rifleman: Girkout				Position: Prone
1355	45	48	A	1-RCB	Nine interrupted bursts due to malfunctions.
				2-RUB	
				3-BOB	Ten magazines were used before satisfactory functioning was obtained.
				3-TRE	
	Rifleman: Moore				Position: Prone
1536	30	78	A	SAT	
		1 May 1957			
	Rifleman: Davis				Position: Prone
	3	81	A	SAT	Fouling shots
0923	31	112	A	1-FJ	One interrupted burst due to malfunction.
	Rifleman: Davis				Position: Standing
1010	31	143	A	1-FJ	One interrupted burst due to malfunction.
				1-FX	
	Rifleman: Moore				Position: Standing
1130	3	146	A	SAT	One shot missed target due to improper position of aiming point. Aiming point was relocated.
1140	30	176	A	1-FJ	

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	FUNCTION REPORT: TYPE FIRE	FUNCTION	REMARKS
	Rifleman: Girkout				Position: Standing
1306	30	206	A	SAT	

BENCH REST ACCURACY TEST

Targets were obtained at 100 and 300 yards simultaneously.

9 May 1957

	Rifleman: Davis				
	3	209	S	SAT	Fouling shots.
0942	10	219	S	1-PJ	
1004	9	228	S	SAT	Only nine shots were fired. Target was disregarded.
1026	10	238	S	SAT	
1045	10	248	S	SAT	
	Rifleman: Valentini				
1107	10	258	S	SAT	Two shots missed target at 300 yards due to improper location of aiming point. Target was disregarded.
1123	10	268	S	SAT	
1155	10	278	S	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Rifle, Caliber .22, T48, Serial Number 1616 Weight of rifle with empty magazine 9.80 lbs Average trigger pull 5.7 lbs			
		Cartridge, Ball, Caliber .22, T48			
		AUTOMATIC ACCURACY TEST			
		Procedure called for firing in three-round bursts.			
		1 May 1957			
	3	3	S	SAT	Sighting shots fired by Davis
	Rifleman: Moore			Position: Prone	
1410	33	36	A	SAT	One interrupted burst due to gunner releasing trigger prematurely.
	Rifleman: Davis			Position: Prone	
1530	30	66	A	SAT	
		2 May 1957			
	Rifleman: Girkout			Position: Prone	
	3	69	A	SAT	Fouling shots.
0907	30	99	A	SAT	
	Rifleman: Girkout			Position: Standing	
0940	30	129	A	SAT	
	Rifleman: Davis			Position: Standing	
1345	30	159	A	SAT	
	Rifleman: Moore			Position: Standing	
1445	30	189	A	SAT	
		BENCH-REST ACCURACY TEST			
		Targets were obtained at 100 and 300 yards simultaneously.			
		7 May 1957			
	Rifleman: Valentini				
	3	192	S	SAT	Fouling shots.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
	Rifleman: Valentini				
1235	10	202	S	1-FF	
1255	10	212	S	SAT	
1317	10	222	S	SAT	
	Rifleman: Davis				
1354	10	232	S	SAT	
1420	10	242	S	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Rifle, Caliber .22, T48, Serial Number 1909 Weight of rifle with empty magazine 9.68 lbs Average trigger pull 6.9 lbs			
		Cartridge, Ball, Caliber .22, T48			
		BENCH-REST ACCURACY TEST			
		Targets were obtained at 100 and 300 yards simultaneously. 7 May 1957			
	Riflemen: Davis				
	3	3	S	SAT	Sighting shots.
1218	10	13	S	SAT	One sheared rim observed while inspecting cases.
1242	10	23	S	1-CRE 1-FF 1-RCB	
1310	10	33	S	SAT	
	Riflemen: Valentini				
1332	10	43	S	SAT	One shot hit frame at 100 yards due to improper location of aiming point. Target was disregarded.
1403	10	53	S	SAT	Four shots hit frame at 100 yards due to improper location of aiming point. Target was disregarded.
1432	10	63	S	SAT	
1441	10	73	S	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Rifle, Caliber .30, T48, Serial Number 4085 Weight of rifle with empty magazine 9.77 lbs Average trigger pull 9.5 lbs			
		Cartridge, AP, Caliber .30, T93E2 Lot LC12010			
		AUTOMATIC ACCURACY TEST			
		Procedure called for firing in three-round bursts.			
		30 April 1957			
	3	3	SS	SAT	Sighting shots fired by Davis.
		1 May 1957			
	Rifleman: Girkout			Position: Prone	
	3	6	SS	SAT	Fouling shots
1500	32	38	A	SAT	One large and one small leak in primer joint. One interrupted burst, due to gunner releasing trigger prematurely.
		2 May 1957			
	Rifleman: Girkout			Position: Standing	
	3	41	A	SAT	Fouling shots.
1005	30	71	A	SAT	
	Rifleman: Davis			Position: Prone	
1100	30	101	A	SAT	Three small leaks in primer joint.
	Rifleman: Moore			Position: Prone	
1135	33	134	A	SAT	Four small leaks in primer joint. One interrupted burst due to gunner releasing trigger prematurely.
	Rifleman: Moore			Position: Standing	
1240	30	164	A	SAT	Two small leaks in primer joint.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
	Rifleman: Davis		Position: Standing		
	3	167	A	SAT	One shot missed the target due to improper location of aiming point. Aiming point was relocated.
1330	30	197	A	SAT	One large and four small leaks in primer joint.

BENCH-REST ACCURACY TEST

Targets were obtained at 100 and 300 yards simultaneously.

9 May 1957

	Rifleman: Valentini				
	3	200	S	SAT	Fouling shots
0556	10	210	S	SAT	One shot hit frame at 100 yards due to improper location of aiming point. Target was disregarded.
1018	10	220	S	SAT	Two small leaks in primer joint.
1037	10	230	S	SAT	Five small leaks in primer joint.
1056	10	240	S	SAT	Three small leaks in primer joint.
	Rifleman: Davis				
1110	10	250	S	SAT	One large and two small leaks in primer joint.
1128	10	260	S	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Rifle, U.S., Caliber .30, M1, Modified, Serial Number 5973453			
		PLATE PENETRATION TEST			
		14 May 1957			
		Range: 100 yards			
		Cartridge, Ball, Caliber .30, Duplex			
	4	4	SS	SAT	Fouling and locating shots.
1341-1413	6	10	SS	SAT	
		Cartridge, Ball, Caliber .30, Triplex			
1417-1445	5	15	SS	SAT	
		HELMET PENETRATION TEST			
		Range : 300 yards			
		15 May 1957			
		Cartridge, Ball, Caliber .30, Duplex			
	2	17	SS	SAT	Fouling shots
1327-1500	27	44	SS	SAT	
		Cartridge, Ball, Caliber .30, Triplex			
	2	46	SS	SAT	Locating shots
1540-1545	5	51	SS	SAT	
		16 May 1957			
	2	53	SS	SAT	Fouling shots
0928-1029	22	75	SS	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
			Range: 200 yards		
1104-1129	12	87	SS	SAT	
			Range: 100 yards		
1242-1304	13	100	SS	SAT	
		Cartridge, Ball, Caliber .30, Duplex			
			Range: 400 yards		
	2	102	SS	SAT	Locating shots
1406-1445	26	128	SS	SAT	

ACCURACY TEST

Targets were obtained at 100 and 300 yards simultaneously.
Fired from heavy-model accuracy cradle.

23 May 1957
Cartridge, Ball, Caliber .30, Triplex

	3	131	SS	SAT	Locating shots.
			27 May 1957		
	1	132	SS	SAT	Fouling shot
	10	142	S	SAT	Locating shots.
1010	10	152	S	SAT	
1025	10	162	S	SAT	
1051	10	172	S	SAT	
1112	10	182	S	SAT	
		Cartridge, Ball, Caliber .30, Duplex			
1124	10	192	S	SAT	
1145	10	202	S	SAT	
1156	10	212	S	SAT	
1203	10	222	S	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		TIME-OF-FLIGHT AND REMAINING VELOCITY TEST			
		Fired From Heavy-Model Accuracy Cradle			
		Range: 100 yards			
		21 May 1957			
		Cartridge, Ball, Caliber .30, Duplex			
	1	223	SS	SAT	Sighting shot
		Cartridge, Ball, Caliber .30, Triplex			
	1	224	SS	SAT	Sighting shot
		Cartridge, Ball, Caliber .30, Duplex			
1732-1943	4	228	SS	SAT	Fired to check instruments
		22 May 1957			
1800-2105	23	251	SS	SAT	1- split in neck of case.
		23 May 1957			
		Cartridge, Ball, Caliber .30, Triplex			
1700-2111	19	270	SS	SAT	
		27 May 1957			
1505-1550	5	275	SS	SAT	
		28 May 1957			
0940-1140	21	296	SS	SAT	
1243-1353	18	314	SS	SAT	1- split in neck of case.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
			Cartridge, Ball, Caliber .30, Duplex		
1400-1503	12	326	SS	SAT	
			7 June 1957		
			Range: 300 yards		
1700-2156	75	401	SS	SAT	
			10 June 1957		
			Cartridge, Ball, Caliber .30, Triplex		
1642-2130	72	473	SS	SAT	
			Range: 500 yards		
			12 June 1957		
			Cartridge, Ball, Caliber .30, Duplex		
1813-2143	34	507	SS	SAT	
			17 June 1957		
1819-2002	18	525	SS	SAT	
			Cartridge, Ball, Caliber .30, Triplex		
2012-2154	29	554	SS	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Rifle, U.S., Caliber .30, M1, Modified, Serial Number 5977047			
		ACCURACY TEST			
		Fired from Heavy-Model Accuracy Cradle.			
		Targets were obtained at 100 and 300 yards simultaneously.			
		27 May 1957			
		Cartridge, Ball, Caliber .30, Duplex			
	1	1	SS	SAT	Fouling shot
1301	10	11	S	SAT	
1311	10	21	S	SAT	
1322	10	31	S	SAT	
1332	10	41	S	SAT	
		Cartridge, Ball, Caliber .30, Triplex			
	10	51	S	SAT	Locating shots
1400	10	61	S	SAT	
1415	10	71	S	SAT	
1427	10	81	S	SAT	
1445	10	91	S	SAT	
		50-YARD BENCH-REST ACCURACY TEST			
		11 June 1957			
					The rear sight was set at 10 clicks elevation and 0 windage.
1031	10	101	S	SAT	Preliminary target.
1046	10	111	S	SAT	
1059	10	121	S	SAT	
1112	10	131	S	SAT	
1131	10	141	S	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Rifle, U.S., M1903, Serial Number 4747051 With Caliber .22 Accuracy Barrel Assembled. Barrel Manufactured by Code H 8/4/54 Cartridge, Ball, Caliber .22, T48			
		VELOCITY TEST			
		25 April 1957			
	3	3	SS	SAT	Fouling shots
1528-1547	20	23	SS	SAT	
		26 April 1957			
		MACHINE-REST ACCURACY TEST			
		Targets were obtained at 100 and 300 yards simultaneously.			
	3	26	SS	SAT	Fouling shots
1433	10	36	SS	SAT	
1446	10	46	SS	SAT	
1459	10	56	SS	SAT	
1508	10	66	SS	SAT	
1518	10	76	SS	SAT	
		HELMET PENETRATION TEST			
		Range: 500 yards			
		3 May 1957			
	3	79	SS	SAT	Fouling shots
1250-1319	20	99	SS	SAT	
		TIME OF FLIGHT AND REMAINING VELOCITY TEST			
		Range: 600 yards			
		20 May 1957			
	2	101	SS	SAT	Fouling shots.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
1430-1514	29	130	SS	SAT	
		Range: 400 yards			
		21 May 1957			
	2	132	SS	SAT	Fouling shots.
1250-1318	24	156	SS	SAT	
		Range: 200 yards			
		22 May 1957			
	2	158	SS	SAT	Fouling shots.
1044-1136	32	190	SS	SAT	
		100-YARD MACHINE REST ACCURACY TEST			
		10 June 1957			
					Metal fouling removed from bore.
	3	193	SS	SAT	Sighting shots.
		Cartridge, Ball, Caliber .22, T48, with original bullet replaced with 68-grain bullet			
1513	10	203	SS	SAT	
1516	10	213	SS	SAT	
		Cartridge, Ball, Caliber .22, handloaded with bullet removed from the T48 round, 42 grains 4350 propellant, and WCC-9 primer.			
1521	10	223	SS	SAT	
1526	10	233	SS	SAT	
		12 June 1957			
		Cartridge, Ball, Caliber .22, T48			
	3	236	SS	SAT	Sighting shots.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Cartridge, Ball, Caliber .22, handloaded with bullet removed from the T48 round, 42 grains 4350 propellant and WCC-9 primer			
1512	10	246	SS	SAT	
1517	10	256	SS	SAT	
		Cartridge, Ball, Caliber .22, T48, with original bullet replaced with 68-grain bullet.			
1521	10	266	SS	SAT	
1525	10	276	SS	SAT	
		13 June 1957			
		Cartridge, Ball, Caliber .22, T48			
	3	279	SS	SAT	Sighting shots.
		Cartridge, Ball, Caliber .22, handloaded with WCC-9 primer, 68-grain bullet, and 42 grains 4350 propellant.			
1352	10	289	SS	SAT	
1355	10	299	SS	SAT	
		Cartridge, Ball, Caliber .22, handloaded with propellant removed from T48 round, WCC-9 primer, and 68-grain bullet.			
1421	10	309	SS	SAT	
1425	10	319	SS	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		VELOCITY TEST			
		Cartridge, Ball, Caliber .22, T48 Fired with full and reduced charges.			
		25 June 1957			
0849	3	322	SS	SAT	Fouling shots.
0852	5	327	SS	SAT	Full charge (44.3 grains).
0858	5	332	SS	SAT	39.0 grains propellant.
0905	5	337	SS	SAT	34.0 grains propellant.
0910	5	342	SS	SAT	24.0 grains propellant with Kapok wad.
0917	4	346	SS	SAT	14.0 grains propellant with Kapok wad.
1000	2	348	SS	SAT	Full charge used to check instrumentation.
1005	6	354	SS	SAT	14.0 grains propellant with Kapok wad.
		ARMOR-VEST RETARDATION TEST			
		5 July 1957			
1433-1438	3	357	SS	SAT	Fouling shots.
1440-1450	6	363	SS	SAT	Full charge. (44.3 grains).
1453-1501	5	368	SS	SAT	39.5 grains propellant.
1503-1511	5	373	SS	SAT	35.0 grains propellant.
1513-1548	11	384	SS	SAT	29.5 grains propellant with Kopak wad.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Rifle, Code E, M70, Serial Number 304164 with Caliber .22 Carbine Accuracy Barrel Assembled. Barrel Manufactured by Code G, 19 August 54			
		Cartridge, Ball Caliber .22, Carbine			
		VELOCITY TEST			
		25 April 1957			
	3	3	SS	SAT	Fouling shots
1439-1518	22	25	SS	SAT	Velocity was not recorded on two rounds.
		MACHINE-REST ACCURACY TEST			
		Targets were obtained at 100 and 300 yards simultaneously.			
		26 April 1957			
	3	28	SS	SAT	Fouling shots.
1327	10	38	SS	SAT	
1341	10	48	SS	SAT	
1350	10	58	SS	SAT	
1400	10	68	SS	SAT	
1415	10	78	SS	SAT	
		HELMET PENETRATION TEST			
		Range: 500 yards			
		3 May 1957			
	6	84	SS	SAT	Fouling and locating shots.
1349-1502	45	129	SS	1 - FX	
		Range: 300 yards			
1550-1607	17	146	SS	3 - FX	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
			6 May 1957		
	3	149	SS	SAT	Fouling shots.
1125-1140	21	170	SS	SAT	
			Range: 400 yards		
1235-1335	43	213	SS	SAT	

PLATE-PENETRATION TEST

15 May 1957
Range: 100 yards

0920-0922	5	218	SS	SAT	

TIME-OF-FLIGHT AND REMAINING-VELOCITY TEST

Range: 600 yards

20 May 1957

	2	220	SS	SAT	Fouling shots.
1350-1415	28	248	SS	SAT	
			Range: 400 yards		
			21 May 1957		
	4	252	SS	SAT	Fouling and locating shots.
1135-1150	22	274	SS	SAT	
			Range: 200 yards		
			22 May 1957		
	4	278	SS	SAT	Fouling and locating shots.
1235-1315	28	306	SS	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		VELOCITY TEST			
		Fired with full and reduced charges			
		24 June 1957			
1333	3	309	SS	SAT	Fouling shots.
1337	5	314	SS	SAT	Full charge (16.2 grains).
1342	5	319	SS	SAT	13.0 grains propellant.
1347	5	324	SS	SAT	10.0 grains propellant with Kapok wad.
1353	5	329	SS	SAT	7.0 grains propellant with Kapok wad.
		ARMOR-VEST RETARDATION TEST			
		5 July 1957			
0905	3	332	SS	SAT	Fouling shots.
0910	1	333	SS	SAT	Full charge. (16.2 grains).
0922-1215	4	337	SS	SAT	Checking out velocity counters and initiators.
1250-1308	9	346	SS	SAT	
1315-1323	5	351	SS	SAT	11.0 grains propellant with Kapok wad.
1325-1359	8	359	SS	SAT	6.5 grains propellant with Kapok wad.
1401-1409	5	364	SS	SAT	2.5 grain propellant with Kapok wad. Rd. 362- bullet did not leave bore. Rd. 363 - bullet did not leave bore. Rd. 364- bullet did not leave bore.
		10 July 1957			
1053-1112	5	369	SS	SAT	3.5 grains propellant with Kapok wad.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
			26 July 1957		
0910-0915	3	372	SS	SAT	Locating shots.
0940-1020	7	379	SS	SAT	Checking velocity initiators.
1030-1048	5	384	SS	SAT	3.5 grains propellant with Kapok wad.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Rifle, Code E, M70, Serial No. 364827 with Caliber .22 Test Barrel Manufactured by Code G 29 December 55			
		Cartridge, Ball, Caliber .22 with 50-Grain Bullet, Lot 10LX4 with full and reduced charges.			
		24 June 1957			
		VELOCITY TEST			
0945	6	6	SS	SAT	Checking instrumentation.
1037	3	9	SS	SAT	Fouling shots.
1044	5	14	SS	SAT	Full charge. (44.7 grains).
1049	5	19	SS	SAT	43.0 grains propellant.
1056	5	24	SS	SAT	38.0 grains propellant.
1102	5	29	SS	SAT	28.0 grains propellant with Kapok wad.
1107	5	34	SS	SAT	18.0 grains propellant with Kapok wad.
		Cartridge, Ball, Caliber .22, T48 with full and reduced charges.			
1527	3	37	SS	SAT	Fouling shots.
1530	5	42	SS	SAT	Full charge (44.3 grains).
1535	5	47	SS	SAT	39.0 grains propellant.
		ARMOR VEST RETARDATION TEST			
		3 July 1957			
		Cartridge, Ball, Caliber .22 with 50-Grain Bullet, Lot 10LX4 with full and reduced charges.			
0855	3	50	SS	SAT	Fouling shots.
0904	5	55	SS	SAT	Full charge. (44.7 grains).
0914	6	61	SS	SAT	41.0 grains propellant.
1006	10	71	SS	SAT	31.5 grains propellant.
1022-1330	13	84	SS	SAT	21.0 grains propellant with Kapok wad.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Cartridge, Caliber .22, Loaded with 50-Grain Full Patch Front Bullets for Caliber .22-06 Duplex Cartridge and IMR No. 4895 Propellant, Lot ALA. 2423			
		VELOCITY TEST			
		10 July 1957			
1430-1435	3	87	SS	SAT	Fouling shots.
1447	1	88	SS	SAT	25.0 grains propellant.
1453	1	89	SS	SAT	30.0 grains propellant.
1457	1	90	SS	SAT	35.0 grains propellant.
1500	1	91	SS	SAT	[illegible].0 grains propellant.
1505	1	92	SS	SAT	37.5 grains propellant.
1516-1521	5	97	SS	SAT	37.0 grains propellant.
		11 July 1957			
0955-0958	3	100	SS	SAT	Fouling shots.
1002-1010	6	106	SS	SAT	32.0 grains propellant.
1012-1016	5	111	SS	SAT	27.0 grains propellant.
1017-1022	5	116	SS	SAT	17.0 grains propell[illegible] with Kapok wad.
		ARMOR-VEST RETARDATION TEST			
1345-1402	3	119	SS	SAT	Fouling shots.
1408-1422	6	125	SS	SAT	37.0 grains propellant.
1428-1446	6	131	SS	SAT	28.5 grains propellant.
1443-1456	5	136	SS	SAT	20.0 grains propellant with Kapok wad.
1458-1505	5	141	SS	SAT	12.0 grains propellant with Kapok wad.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Cartridge, Caliber .22, Loaded with 50-Grain Full Patch Front Bullet for Caliber .22-06 Duplex Cartridge and 37.0 Grains of DNR No. 4895 Propellant Lot ALA. 2423.			
		TIME-OF-FLIGHT TEST			
	16 July 1957				Range: 600 yards
1109-1111	3	144	SS	SAT	Fouling shots.
1116-1215	39	183	SS	SAT	
					Range: 400 yards
1449-1452	3	186	SS	SAT	Sighting shots.
1502-1600	36	222	SS	SAT	
	17 July 1957				
1057-1059	3	225	SS	SAT	Fouling shots.
1100-1129	17	242	SS	SAT	
	18 July 1957				Range: 200 yards
1000-1017	3	245	SS	SAT	Fouling shots.
1020-1102	31	276	SS	SAT	
		100-YARD MACKLOE REST ACCURACY TEST			
	7 August 1957				
1315	3	279	SS	SAT	Fouling shots.
1326	10	289	SS	SAT	
1336	10	299	SS	SAT	
1346	10	309	SS	SAT	
1356	10	319	SS	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		PLATE PENETRATION TEST			
		5 September 1957			Range: 200 yards
1407	3	322	SS	SAT	Fouling shots.
1410-1415	5	327	SS	SAT	
		HELMET PENETRATION TEST			
					Range: 600 yards
1432	4	331	SS	SAT	Sighting shots.
1436-1452	17	348	SS	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS

Rifle, Code E,M70, Serial No.367844 with
Caliber .25 Test Barrel Manufactured by Code G 26 Apr 56

Cartridge, Ball, Caliber .25 with 75-Grain Bullet,
Lot 74MC31 with full and reduced charges.

21 June 1957

VELOCITY TEST

1307	4	4	SS	SAT	Fouling shots.
1312	6	10	SS	SAT	Full charge
1316	5	15	SS	SAT	41.0 grains propellant.
1325	5	20	SS	SAT	36.0 grains propellant.
1328	5	25	SS	SAT	26.0 grains propellant.

ANKF-VERT RETARDATION TEST

10 July 1957

0844-0846	3	28	SS	SAT	Fouling shots.
0854-0906	6	34	SS	SAT	Full charge.
0916-0947	6	40	SS	SAT	38.0 grains propellant.
0950-1004	6	46	SS	SAT	25.5 grains propellant.
1007-1018	6	52	SS	SAT	21.5 grains propellant.

26 July 1957

0820-0835	4	56	SS	SAT	Fired to foul the bore and to check the instrumentation.
0848-0857	5	61	SS	SAT	30.5 grains propellant.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Rifle, Code E M70, Serial No. 367368 with Caliber .27 Test Barrel Manufactured by Code G 2 May 56			
		Cartridge, Ball, Caliber .27 with 95-Grain Bullet, Lot 66LM62 with full and reduced charges.			
		24 June 1957			
		VELOCITY TEST			
1445	3	3	SS	SAT	Fouling shots.
1448	5	8	SS	SAT	Full charge. (44.7 Grains).
1453	5	13	SS	SAT	40.0 grains propellant.
1458	5	18	SS	SAT	35.0 grains propellant.
1504	5	23	SS	SAT	25.0 grains propellant.
		ARMOR-VEST RETARDATION TEST			
		2 July 1957			
1259	2	25	SS	SAT	Fouling shots.
1304	6	31	SS	SAT	Full charge.
1317	7	38	SS	SAT	37.5 grains propellant.
1359	7	45	SS	SAT	31.0 grains propellant.
1420	9	54	SS	SAT	23.0 grains propellant.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Rifle, U.S., M1903, Serial Numbe 1515142 with Caliber .30 Accuracy Test Barrel Cartridge, Ball, Caliber .30, M2, Lot PA 4310 with full and reduced charges.			
		VELOCITY TEST			
		21 June 1957			
1102	3	3	SS	SAT	Fouling shots.
1108	5	8	SS	SAT	Full charge.
1110	5	13	SS	SAT	45.0 grains propellant.
1129	5	18	SS	SAT	40.0 grains propellant.
1134	5	23	SS	SAT	30.0 grains propellant.
1517	3	26	SS	SAT	Fouling shots.
1520	5	31	SS	SAT	43.0 grains propellant.
1525	5	36	SS	SAT	36.5 grains propellant.
1530	5	41	SS	SAT	29.5 grains propellant.
		ARMOR VEST RETARDATION TEST			
		2 July 1957			
0940	4	45	SS	SAT	Fouling shots.
0954	5	50	SS	SAT	Full charge.
1015	5	55	SS	SAT	43.0 grains propellant.
1028	7	62	SS	SAT	35.5 grains propellant.
1056	7	69	SS	SAT	28.0 grains propellant.
		Cartridge, Caliber .30 Loaded with 1st Duplex Bullet and Western Ball-Type Propellant, Lot AL-2796-45			
		9 July 1957			
		VELOCITY TEST			
1110	1	70	SS	SAT	25.0 grains propellant with Kapok wad.
1131-1135	4	74	SS	SAT	
1244-1248	5	79	SS	SAT	20.0 grains propellant with Kapok wad.
1251-1255	5	84	SS	SAT	15.0 grains propellant with Kapok wad.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
1311-1316	5	89	SS	SAT	10.0 grains propellant with Kapok wad.

Cartridge, Caliber .30, Loaded with 1st Triplex Bullet and Western Ball-Type Propellant, Lot AL-2796-45.

9 July 1957

VELOCITY TEST

1333	1	90	SS	SAT	25.0 grains propellant with Kapok wad.
1355-1359	5	95	SS	SAT	22.0 grains propellant with Kapok wad.
1414-1418	5	100	SS	SAT	17.0 grains propellant with Kapok wad.
1423-1427	5	105	SS	SAT	12.0 grains propellant with Kapok wad.
1433-1437	5	110	SS	SAT	7.0 grains propellant with kapok wad.

ARMOR-VEST RETARDATION TEST

12 July 1957

Cartridge, Caliber .30, Loaded with 1st Duplex Bullet and Western Ball-Type Propellant, Lot AL-2796-45.

1121-1319	3	113	SS	SAT	Fired to foul the bore and to check the instrumentation.
1324-1402	8	121	SS	SAT	25.0 grains propellant with Kapok wad.
1418-1426	5	126	SS	SAT	16.0 grains propellant with Kapok wad.
1428-1436	5	131	SS	SAT	10.0 grains propellant with Kapok wad.
1450-1535	10	141	SS	SAT	7.0 grains propellant with Kapok wad.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Cartridge, Ball, Caliber .30, M2, Lot FA 4332 (Control)			
		TIME-OF-FLIGHT TEST			
	15 July 1957				Range: 600 Yards
1443-1449	3	144	SS	SAT	Sighting shots.
	16 July 1957				
1037-1039	3	147	SS	SAT	Fouling shots.
1040-1101	22	169	SS	SAT	
					Range: 400 Yards
1411-1412	3	172	SS	SAT	Sighting shots.
1413-1440	26	198	SS	SAT	
	18 July 1957				Range: 200 Yards
0859-0927	4	202	SS	SAT	Sighting shots.
0928-0946	19	221	SS	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
26 July 1957					
ARMOR VEST RETARDATION TEST					
Cartridge, Caliber .30, Loaded with 2nd Duplex Bullet and Western Ball-Type Propellant, Lot AL-2796-45					
1232-1245	5	226	SS	SAT	Fouling shots.
1251-1259	5	231	SS	SAT	22.5 grains propellant with Kapok wad.
1303-1308	5	236	SS	SAT	14.5 grains propellant with Kapok wad.
1327-1512	11	247	SS	SAT	9.5 grains propellant with Kapok wad.
1518-1549	8	255	SS	SAT	7.0 grains propellant with Kapok wad.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
	29 July 1957				
	Cartridge, Caliber .30, Loaded with 1st Triplex Bullet and Western Ball-Type Propellant, Lot AL-2796-45				
0930-0935	3	258	SS	SAT	Fouling shots.
0943-1022	6	264	SS	SAT	22.0 grains propellant with Kapok wad.
1030-1038	5	269	SS	SAT	11.0 grains propellant with Kapok wad.
1042-1146	11	280	SS	SAT	6.0 grains propellant with Kapok wad.
1238-1322	11	291	SS	SAT	4.5 grains propellant with Kapok wad.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Cartridge, Caliber .30, Loaded with 2nd Triplex Bullet and Western Ball-Type Propellant, Lot AL-2796-45			
1355-1400	5	296	SS	SAT	21.0 grains propellant with Kapok wad.
1403-1533	9	305	SS	SAT	10.0 grains propellant with Kapok wad.
1537-1558	6	311	SS	SAT	6.0 grains propellant with Kapok wad.
	31 July 1957				
0850-0856	3	314	SS	SAT	Fouling shots.
0914-0917	2	316	SS	SAT	6.0 grains propellant with Kapok wad.
0922-1107	18	334	SS	SAT	4.0 grains propellant with Kapok wad.
1318-1347	7	341	SS	SAT	3.0 grains propellant with Kapok wad Rd. 335- bullet did not leave bore.
1413-1445	5	346	SS	SAT	3.5 grains propellant with Kapok wad.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Cartridge, Caliber .30, Loaded with 3rd Triplex Bullet and Western Ball-Type Propellant, Lot AL-2796-45			
1450-1501	5	351	SS	SAT	20.0 grains propellant with Kapok wad.
1504-1512	5	356	SS	SAT	9.5 grains propellant with Kapok wad.
1514-1520	5	361	SS	SAT	5.5 grains propellant with Kapok wad.
	9 September 1957				
		Cartridge, Caliber .30, Loaded with 1st Duplex Bullet and Western Ball-Type Propellant, Lot AL-2796-45.			
1040-1045	2	363	SS	SAT	Checking instrumentation.
1331-1336	3	366	SS	SAT	Fouling shots.
1344-1406	10	376	SS	SAT	7.0 grains propellant.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
Rifle, U.S., M1903, Serial No. 1521616 with Cal..30, Accuracy Test Barrel Cartridge, Ball, Caliber .30, M2, Lot FA[illegible]07					
TIME-OF-FLIGHT AND REMAINING VELOCITY TEST					
	20 May 1957			Range:	600 Yards
	3	3	SS	SAT	Fouling shots.
1311-1327	20	23	SS	SAT	
	21 May 1957			Range:	400 Yards
	2	25	SS	SAT	Fouling shots.
1330-1345	22	47	SS	SAT	
	22 May 1957			Range:	200 Yards
	2	49	SS	SAT	Fouling shots.
1000-1017	26	75	SS	SAT	

FUNCTION REPORT

RDS	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	FUNCTION	REMARKS
			Barrel, Pressure, Caliber .30, No. 3830 Manufactured by Springfield Armory, July 1954 with Special Duplex Chamber. Assembled to Universal Receiver No. 197 Barrel length: 24 inches Twist: 1 in 10 inches.	
			17 June 1957	
			PRESSURE TEST	
			Cartridge, Ball, Caliber .30, Duplex	
1150	2	2	SAT	Fouling shots.
1242-1429	28	30	SAT	Velocities were not recorded on eight rounds.
			Cartridge, Ball, Caliber .30, Triplex	
1445-1520	20	50	SAT	
			Cartridge, Caliber .30, Hand-loaded with: Case: Caliber .30, Lot FA Y30-375 Bullet: AP, M2, Lot FA Y30-374 Propellant: IMR 4895 Lot 2057 Charge: 48.5 Grains	
1529-1608	20	70	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Barrel, Pressure, Caliber .22 Carbine, Manufactured by Code G. 16 August 1954 Receiver, Universal, Number 127 Firing Pin Protrusion: 0.050 inch Cartridge, Ball, Caliber .22, Carbine			
		PRESSURE TEST			
	25 April 1957				
	3	3		SAT	Fouling shots.
1311-1355	21	24		SAT	Velocity was not recorded on one round.
		Shotgun, Code A, 12 gauge Shell, Flechette, Type L-11 (AA-32)			
	2 August 1957				
		VELOCITY, PATTERN AND PENETRATION TEST			
		RANGE: Velocity, 7 ft Pattern, 40 yds Penetration, 100 yds			
1327	1	1	SS	SAT	Fired to check instrumentation.
1340-1505	10	11	SS	SAT	

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION
		13 August 1957		
		PENETRATION TEST		
		RANGE: 200 yds		
0913-0950	5	16	SS	SAT
		5 September 1957		
		RANGE: 300 yds		
1515-1522	10	26	SS	SAT
		RANGE: 400 yds		
1531-1541	20	46	SS	SAT
		6 September 1957		
		RANGE: 500 yds		
1007-1050	75	121	SS	SAT

AUTOMATIC ACCURACY TEST

DATE: 30 April 1957 RANGE: 100 yards

CARBINE, U.S., Caliber .22, M2, Serial Number 7149237

CARTRIDGE: Ball, Caliber .22, Carbine

FIRING POSITION: Prone RIFLEMAN: Davis

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	0.2A	0.1L	7.5A	6.7L	1.2A	8.9L
2	0.2A	0.3R	8.0A	6.8L	14.5A	13.9L
3	0.1R	0.2L	5.4A	5.9L	3.9A	5.4L
4	0.3A	0.5R	10.2A	11.5L	12.3A	15.9L
5	0.8A	0.4R	12.0A	8.7L	13.6A	8.8L
6	0.1A	0.4R	13.9A	9.4L	16.5A	16.0L
7	0.2A	0.1R	8.0A	8.4L	10.2A	13.3L
8	0.6A	0.5R	11.3A	3.5L	10.7A	6.0L
9	0.1A	0.3R	8.5A	4.6L	4.6A	0.2R
10	0.3A	0.1L	8.6A	6.2L	8.3A	6.8L
Average	0.3A	0.2R	9.3A	7.2L	9.6A	9.5L

Score on A target with 10-inch bull's-eye 123

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	EH	ES
	8.8	16.6	16.5	23.3

Mean for shots fired automatically (from center of impact of first shot in each burst) 12.9

AUTOMATIC ACCURACY TEST

DATE: 1 May 1957 RANGE: 100 yards

CARBINE, U.S., Caliber .22, M2, Serial Number 7195081

CARTRIDGE: Ball, Caliber .22, Carbine

FIRING POSITION: Prone RIFLEMAN: Girkout

Fired in three-round bursts. Measurements are given in inches.

FIRST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	0.6B	1.4R	11.6A	4.8L	10.9A	3.9L
2	0.4B	0.9R	13.2A	4.6L	12.8A	9.6L
3	0.0	0.8R	11.8A	3.8L	11.4A	7.9L
4	0.8B	1.6R	13.2A	2.5L	11.7A	6.8L
5	1.4B	1.3R	14.2A	2.6L	15.3A	4.5L
6	0.1A	0.6R	11.2A	4.2L	11.7A	9.2L
7	1.3B	2.0R	9.9A	2.0L	10.6A	5.6L
8	0.8B	1.2R	12.7A	2.9L	12.1A	4.3L
9	0.0	0.6R	13.0A	2.1L	15.9A	2.8L
10	0.4B	0.8R	11.5A	1.2L	11.6A	3.9L
Average	0.6B	1.1R	12.2A	3.0L	12.4A	5.8L

Score on A target with 10-inch bull's-eye 120

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	BV	BH	BS
	9.3	17.3	11.6	18.3

Mean for shots fired automatically (from center of impact of first shot in each burst) 14.2

AUTOMATIC ACCURACY TEST

DATE: 30 April 1957 RANGE: 100 yards

CARBINE, U.S., Caliber .22, M2, Serial Number 7195081

CARTRIDGE: Ball, Caliber .22, Carbine

FIRING POSITION: Prone RIFLEMAN: Moore

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	1.1A	0.3R	23.2A	9.9R	30.4A	16.2R
2	0.7A	0.4R	27.6A	8.8R	36.3A	14.7R
3	0.6A	0.9R	27.8A	13.4R	34.7A	16.8R
4	1.6A	0.3R	25.6A	13.6R	36.6A	19.8R
5	1.1A	1.1R	24.5A	15.8R	34.6A	20.3R
6	0.5A	0.3R	23.2A	14.8R	25.7A	24.0R
7	1.1A	0.3R	24.5A	14.3R	30.9A	21.3R
8	0.4A	0.0R	21.7A	16.1R	25.5A	25.3R
9	0.4A	0.1R	24.2A	13.6R	34.7A	20.3R
10	0.7A	0.3R	25.7A	13.2R	35.3A	23.7R
Average	0.8A	0.4R	24.8A	13.3R	32.5A	20.2R

Score on A target with 10-inch bull's-eye 56

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	EH	ES
	22.6	36.2	25.3	42.1

Mean for shots fired automatically (from center of impact of first shot in each burst) 32.5

AUTOMATIC ACCURACY TEST

DATE: 1 May 195[illegible] RANGE: 100 yards

CARBINE, U.S., Caliber .22, M2, Serial Number 7195081

CARTRIDGE: Ball, Caliber .22, Carbine

FIRING POSITION: Standing RIFLEMAN: Davis

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	1.5A	1.4R	7.5A	2.6R	14.0A	13.4R
2	4.2A	2.2R	15.0A	10.5R	31.3A	20.7R
3	1.0A	2.6R	12.2A	3.0L	36.6A	5.9R
4	2.5A	2.1R	9.1A	5.2L	29.9A	10.9R
5	2.5A	2.5R	13.9A	1.5R	31.3A	17.1R
6	3.5A	2.8R	11.5A	4.0R	34.2A	23.4R
7	2.8A	2.3R	13.2A	8.3R	32.2A	23.5R
8	2.2A	2.2R	12.2A	4.6R	34.2A	24.9R
9	2.1A	3.8R	11.5A	1.6R	30.8A	18.7R
10	1.9A	2.1R	10.5A	10.5R	30.0A	23.9R
Average	2.4A	2.4R	11.7A	3.5R	30.4A	18.2R

Score on A target with 10-inch bull's-eye 89

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	EH	MS
	17.5	35.6	30.1	40.3

Mean for shots fired automatically (from center of impact of first shot in each burst) 21.6

AUTOMATIC ACCURACY TEST

DATE: 1 May 1957 RANGE: 100 yards

CARBINE, U.S., Caliber .22, M2, Serial Number 7195081

CARTRIDGE: Ball, Caliber .22, Carbine

FIRING POSITION: Standing RIFLEMAN: Girkout

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	0.6B	0.6R	8.4A	10.0L	22.1A	5.6L
2	1.6A	1.5R	8.7A	5.5L	22.6A	0.7L
3	0.6A	0.8R	5.5A	6.0L	22.2A	3.7L
4	1.0A	0.8R	5.5A	5.3L	20.3A	4.7L
5	1.7A	2.1R	8.8A	4.5L	24.2A	3.2L
6	2.7A	1.8R	6.2A	6.4L	22.1A	8.2L
7	0.2A	1.7R	6.8A	5.5L	22.9A	2.0L
8	1.5A	0.5R	7.5A	7.8L	24.4A	4.8L
9	2.6A	1.1R	8.3A	5.3L	23.6A	2.6L
10	1.3A	1.5R	7.6A	4.0L	24.9A	1.8L
Average	1.3A	1.2R	7.3A	6.0L	22.9A	3.7L

Score on A target with 10-inch bull's-eye 109

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	EH	ES
	11.6	25.5	12.1	25.6

Mean for shots fired automatically (from center of impact of first shot in each burst) 15.9

AUTOMATIC ACCURACY TEST

DATE 1 May 1957 RANGE: 100 yards

CARBINE, U.S., Caliber .22, M2, Serial Number 7195081

CARTRIDGE: Ball, Caliber .22, Carbine

FIRING POSITION: Standing RIFLEMAN: Moore

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	2.2A	0.5R	9.8A	16.7R	23.4A	14.8R
2	1.1A	1.0R	7.1A	10.8R	19.9A	10.2R
3	1.7A	0.7R	8.3A	8.3R	24.7A	9.8R
4	1.4A	0.8R	6.5A	14.6R	21.9A	15.8R
5	2.0A	0.2R	9.2A	11.5R	25.8A	12.8R
6	2.2A	1.4R	10.6A	15.0R	27.9A	16.9R
7	1.7A	0.2R	11.1A	12.5R	25.7A	11.2R
8	1.5A	0.3L	9.2A	14.0R	25.8A	14.8R
9	1.4A	0.3R	7.7A	15.1R	21.7A	18.5R
10	1.2A	0.1R	7.3A	10.7R	23.6A	8.5R
Average	1.6A	0.5R	8.7A	13.0R	24.0A	13.3R

Score on A target with 10-inch bull's-eye 94

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	EH	ES
	15.0	26.8	18.8	31.6

Mean for shots fired automatically (from center of impact of first shot in each burst) 20.3

AUTOMATIC ACCURACY TEST

DATE 1 May 1957 RANGE: 100 yards

CARBINE, U.S., Caliber .30, M2, Serial Number 7104206

CARTRIDGE: Ball, Carbine, Caliber .30, M1, Lot LC-513769

FIRING POSITION: Prone RIFLEMAN: Davis

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	0.1A	1.1R	36.9A	4.3L	44.4A	8.8L
2	0.0	0.7R	36.2A	3.6R	48.5A	5.2R
3	0.2A	0.9R	38.2A	2.6R	48.5A	8.0R
4	0.5B	0.7R	33.8A	2.4L	44.2A	6.4R
5	0.2A	0.5R	42.0A	1.9R	58.5A	12.2R
6	0.0	1.0R	38.9A	8.8R	48.4A	17.8R
7	0.6B	0.4R	32.3A	5.0R	52.5A	6.5R
8	0.3A	0.4R	40.3A	1.5L	60.7A	8.2R
9	0.2A	0.6L	38.2A	0.8L	47.0A	15.1R
10	0.1A	0.2R	38.3A	3.0R	49.7A	14.2R
Average	0.0	0.5R	37.5A	1.6R	50.2A	8.5R

Score on A target with 10-inch bull's-eye 50

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	MV	MR	MS
	30.0	61.3	26.6	62.0

Mean for shots fired automatically (from center of impact of first shot in each burst) 44.5

AUTOMATIC ACCURACY TEST

DATE: 30 April 1957 RANGE: 100 yards

CARBINE, U.S., Caliber .30, M2, Serial Number 710206

CARTRIDGE: Ball, Carbine, Caliber .30, M1, Lot LC-513769

FIRING POSITION: PRONE RIFLEMAN: Girkout

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	2.7B	0.3R	18.0A	12.9L	22.3A	22.8L
2	1.4B	0.1R	15.9A	8.4L	21.7A	14.4L
3	1.7B	0.1L	17.0A	11.0L	20.2A	17.8L
4	1.8B	0.3L	21.7A	5.9L	22.7A	10.8L
5	1.6B	0.3L	20.3A	6.9L	22.5A	11.0L
6	1.7B	0.0	24.6A	8.2L	27.3A	12.4L
7	1.6B	1.0L	28.3A	6.2L	33.7A	16.4L
8	1.5B	0.4R	22.5A	12.3L	27.7A	16.3L
9	1.4B	0.6L	22.2A	8.1L	24.1A	18.6L
10	1.9B	0.4L	22.4A	8.0L	25.2A	15.4L
Average	1.7B	0.2L	21.3A	8.8L	24.7A	15.5L

Score on A target with 10-inch bull's-eye 81

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EY	EH	ES
	18.2	36.4	23.2	40.1

Mean for shots fired automatically (from center of impact of first shot in each burst) 27.8

AUTOMATIC ACCURACY TEST

DATE 30 April 1957 RANGE: 100 yards

CARBINE, U.S., Caliber .30, M2, Serial Number 7104206

CARTRIDGE. Ball, Carbine, Caliber .30, M1, Lot LC-613769

FIRING POSITION. Prone RIFLEMAN: Moore

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	0.8A	0.3R	47.8A	8.4R	64.8A	9.2R
2	0.3B	0.4R	42.4A	9.2R	64.5A	5.9R
3	0.2A	0.4L	42.2A	9.8R	60.1A	5.9R
4	0.3A	0.3L	41.1A	8.3R	61.3A	8.9R
5	0.1A	0.4L	43.3A	12.6R	61.9A	13.6R
6	C.0	0.7L	43.0A	9.7R	62.1A	10.4R
7	0.2B	0.4L	41.8A	8.3R	58.9A	10.2R
8	0.1B	0.4L	41.8A	6.9R	61.7A	11.9R
9	0.0	0.5L	44.0A	8.4R	64.7A	10.2R
10	0.1B	0.2L	41.9A	7.1R	59.8A	8.4R
Average	0.1A	0.3L	42.9A	8.9R	61.9A	9.5R

Score on A target with 10-inch bull's-eye 50

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	BE	BS
	35.7	65.0	14.3	65.9

Mean for shots fired automatically (from center of impact of first shot in each burst) 53.2

AUTOMATIC ACCURACY TEST

DATE: 1 May 1957 RANGE: 100 yards

CARBINE, U.S., Caliber .30, M2, Serial Number 7104206

CARTRIDGE: Ball, Carbine, Caliber .30, M1, Lot LC-SL3769

FIRING POSITION: Standing RIFLEMAN: Davis

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	0.4A	1.6R	41.1A	19.1R	95.3A	50.4R
2	0.1B	0.9R	40.2A	16.6R	99.6A	45.7R
3	0.5B	1.0R	37.0A	17.7R	95.4A	51.4R
4	0.9A	0.9R	38.9A	23.9R	85.4A	68.6R
5	2.0A	1.9R	40.5A	14.6R	88.8A	56.4R
6	0.2B	0.9R	38.8A	16.6R	87.6A	51.6R
7	1.6A	2.0R	41.0A	17.8R	98.4A	57.8R
8	0.4B	0.5R	39.2A	21.3R	93.2A	57.4R
9	0.9A	0.2R	41.8A	13.9R	95.6A	49.6R
10	1.1A	0.7R	39.7A	14.3R	99.5A	61.0R
Average	0.6A	1.1R	39.8A	17.6R	93.9A	54.3R

Score on A target with 10-inch bull's-eye 50

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	EH	ES
	51.2	100.1	62.4	117.2

Mean for shots fired automatically (from center of impact of first shot in each burst) 75.3

AUTOMATIC ACCURACY TEST

DATE 1 May 1957 RANGE: 100 yards

CARBINE, U.S., Caliber .30, M2, Serial No. 7104206

CARTRIDGE: Ball, Cartrine, Caliber .30, M1, Lot LC-SL3769

FIRING POSITION: Standing RIFLEMAN: Girkout

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	0.2B	0.5R	36.0A	3.1L	86.4A	12.8R
2	0.6A	1.1R	33.8A	4.1L	86.9A	14.6R
3	0.0	0.4L	14.5A	5.5L	85.5A	14.2R
4	1.0A	1.1L	33.9A	4.4L	91.7A	15.9R
5	0.4A	0.2R	32.8A	6.0L	86.5A	12.2R
6	0.3B	0.6R	32.7A	2.6L	86.0A	17.8R
7	0.8B	0.4L	31.0A	3.8L	89.4A	18.4R
8	0.3B	0.3R	31.2A	3.0L	87.8A	20.4R
9	0.6A	0.6R	34.2A	0.0	90.6A	21.0R
10	0.3A	0.5R	30.6A	0.6L	87.3A	21.0R
Average	0.1A	0.2R	31.1A	3.3L	88.0A	16.8R

Score on A target with 16-inch bull's-eye 50

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	EH	ES
	41.2	92.5	27.0	93.9

Mean for shots fired automatically (from center of impact of first shot in each burst) 61.4

AUTOMATIC ACCURACY TEST

DATE: 1 May 1957 RANGE: 100 yards

CARBINE, U.S., Caliber .30, M2, Serial Number 7104206

CARTRIDGE: Ball, Carbine, Caliber .30, M1, Lot LC-SL3769

FIRING POSITION: Standing RIFLEMAN: Moore

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	1.3A	1.2R	49.1A	8.5R	114.7A	9.5L
2	0.4A	0.6R	46.4A	2.7R	105.9A	12.8L
3	0.6A	0.3R	44.2A	3.6R	101.8A	12.9L
4	0.1B	0.4L	43.0A	0.5L	101.5A	13.6L
5	0.5A	0.0	43.8A	1.3R	101.7A	13.7L
6	0.3A	0.1L	44.1A	5.3R	104.8A	10.7L
7	0.1B	0.2L	43.9A	2.5R	105.5A	9.3L
8	0.1A	0.2R	44.0A	2.1R	104.7A	12.4L
9	0.0	0.2R	47.6A	2.2R	106.0A	12.1L
10	0.8B	0.1R	43.9A	8.0R	109.3A	8.0L
Average	0.2A	0.2R	45.0A	3.6R	105.6A	11.4L

Score on A target with 10-inch bull's-eye 50

10-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	EH	ES
	50.7	115.5	24.2	115.8

Mean for shots fired automatically (from center of impact of first shot in each burst) 75.5

AUTOMATIC ACCURACY TEST

DATE: 1 May 1957 RANGE: 100 yards

RIFLE: Caliber .22, T48, Serial Number 1616

CARTRIDGE: Ball, Caliber .22, T48

FIRING POSITION: Prone RIFLEMAN: Davis

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	0.9B	0.0	9.7A	7.5R	22.9A	7.2R
2	1.0B	0.3R	6.1A	8.6R	13.0A	14.3R
3	1.2B	0.5R	10.4A	8.6R	23.3A	10.3R
4	1.2B	0.8L	8.3A	8.7R	17.4A	9.8R
5	1.0B	0.7L	9.4A	7.1R	22.2A	9.7R
6	1.1B	1.2L	10.0A	7.7R	20.1A	12.9R
7	0.4B	0.1R	10.0A	9.1R	21.3A	15.9R
8	0.5B	0.0	11.2A	7.6R	23.4A	5.6R
9	1.3B	1.9L	8.9A	5.6R	24.7A	3.8R
10	1.2B	0.5R	9.3A	11.2R	20.2A	13.9R
Average	1.0B	0.3L	9.3A	8.2R	20.8A	10.3R

Score on A target with 10-inch bull's-eye 104

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	MV	ME	MS
	12.5	26.0	17.8	26.8

Mean for shots fired automatically (from center of impact of first shot in each burst) 19.1

AUTOMATIC ACCURACY TEST

DATE: 2 May 1957 RANGE: 100 yards

RIFLE: Caliber .22, T48, Serial Number 1616

CARTRIDGE: Ball, Caliber .22, T48

FIRING POSITION: Prone RIFLEMAN: Girkout

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	0.4B	0.0	8.2A	8.5R	5.0B	20.6R
2	0.2A	1.4L	8.0A	6.6R	3.9A	10.0R
3	0.3A	1.6L	8.4A	4.4R	2.4A	6.3R
4	0.3A	0.9L	3.1A	4.0R	0.2B	5.0R
5	0.0	0.8L	11.2A	6.8R	9.8A	11.7R
6	0.7A	0.4L	10.5A	4.8R	4.6A	7.9R
7	0.1B	0.1R	6.9A	8.3R	1.6A	9.4R
8	0.1A	0.7L	9.4A	8.1R	6.5A	12.6R
9	0.4A	1.4L	7.8A	6.3R	9.7A	8.2R
10	1.5B	1.1L	5.7A	7.2R	4.3A	14.1R
Average	0.0	0.8L	7.9A	6.5R	3.8A	10.6R

Score on A target with 10-inch bull's-eye 126

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	EH	ES
	7.8	16.2	22.2	22.8

Mean for shots fired automatically (from center of impact of first shot in each burst) 11.8

AUTOMATIC ACCURACY TEST

DATE: 1 May 1957 RANGE: 100 yards

RIFLE: Caliber .22, T48, Serial Number 1616

CARTRIDGE: Ball, Caliber .22, T48

FIRING POSITION: Prone RIFLEMAN: Moore

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	0.4A	0.5R	13.2A	6.4L	10.5A	8.6L
2	1.8A	0.8R	8.7A	10.2L	13.9A	7.2L
3	0.3B	0.1L	14.2A	6.3L	17.0A	11.8L
4	1.8A	1.3L	14.5A	6.5L	17.4A	7.6L
5	0.0	1.6L	16.1A	8.2L	20.2A	11.5L
6	0.2A	0.4L	15.6A	10.6L	18.2A	11.7L
7	0.5A	0.1L	13.1A	9.1L	16.3A	12.7L
8	0.3A	2.0L	13.4A	7.4L	16.3A	8.4L
9	0.4B	0.2R	14.3A	6.9L	20.6A	4.7L
10	0.2B	0.9R	14.3A	7.5L	18.0A	8.8L
Average	0.4A	0.5L	13.7A	7.9L	16.8A	9.3L

Score on A target with 10-inch bull's-eye 109

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	EH	ES
	12.2	21.0	13.6	23.3

Mean for shots fired automatically (from center of impact of first shot in each burst) 17.1

AUTOMATIC ACCURACY TEST

DATE: 2 May 1957 RANGE: 200 yards

RIFLE: Caliber .22, T48, Serial Number 1616

CARTRIDGE: Ball, Caliber .22, T48

FIRING POSITION: Standing RIFLEMAN: Davis

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	1.5A	0.2R	15.7A	9.5R	25.0A	23.2R
2	0.6A	0.6R	11.8A	10.0R	25.1A	20.7R
3	3.0A	1.1L	15.9A	8.5R	36.5A	24.6R
4	3.0A	0.7L	18.5A	14.1R	44.9A	36.9R
5	0.3A	0.2R	18.5A	11.4R	44.4A	33.1R
6	1.9A	0.2L	14.3A	11.4R	36.0A	30.9R
7	3.4A	1.3L	17.1A	8.8R	45.8A	28.8R
8	2.3A	1.0R	24.9A	5.5R	49.4A	29.2R
9	0.7A	0.1R	21.7A	12.3R	46.6A	29.3R
10	0.5A	0.0	20.9A	14.6R	51.6A	38.7R
Average	1.7A	0.1L	17.9A	10.6R	40.5A	29.7R

Score on A target with 10-inch bull's-eye 75

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	BV	BH	BS
	24.5	51.3	38.0	60.7

Mean for shots fired automatically (from center of impact of first shot in each burst) 34.4

AUTOMATIC ACCURACY TEST

DATE: 2 May 1957 RANGE: 100 yards

RIFLE: Caliber .22, T48, Serial Number 1016

CARTRIDGE: Ball, Caliber .22, T48

FIRING POSITION: Standing RIFLEMAN: Girtout

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	1.0A	0.6L	5.6A	8.5R	21.7A	18.7R
2	1.8A	0.3L	7.4A	6.6R	13.5A	12.9R
3	1.1A	0.3R	4.5A	5.5R	20.9A	14.5R
4	0.8A	0.1R	13.2A	5.7R	43.1A	16.2R
5	1.4A	0.1L	12.2A	4.9R	35.4A	22.1R
6	1.2R	1.0L	11.3A	5.7R	43.0A	22.7R
7	2.0A	1.3L	10.9A	0.4R	36.4A	14.6R
8	2.4A	0.3L	12.4A	4.8R	38.6A	15.5R
9	2.0A	2.4L	11.9A	c.1R	38.4A	18.7R
10	0.4A	0.2L	10.7A	4.8R	39.9A	22.5R
Average	1.2A	0.6L	10.0A	4.9R	33.1A	17.8A

Score on A target with 10-inch bull's-eye 94

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	EH	ES
	17.0	44.3	25.2	50.2

Mean for shots fired automatically (from center of impact of first shot in each burst) 23.9

AUTOMATIC ACCURACY TEST

DATE: 2 May 1957 RANGE: 100 yards

RIFLE: Caliber .22, T48, Serial Number 1616

CARTRIDGE: Ball, Caliber .22, T48

FIRING POSITION: Standing RIFLEMAN: Moore

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	1.5A	1.3L	16.4A	1.6L	40.6A	9.3L
2	0.4A	0.1L	12.9A	0.8L	35.7A	4.6L
3	0.4B	1.2L	15.0A	1.4L	34.6A	6.2L
4	1.0A	0.0	15.6A	2.5L	40.4A	12.5L
5	0.1A	0.4R	14.6A	2.1L	39.9A	14.2L
6	1.3A	0.3L	16.5A	1.2L	37.5A	5.5L
7	0.1B	0.3L	15.5A	1.6L	40.7A	10.9L
8	0.4B	0.6L	14.5A	0.8L	38.4A	11.2L
9	0.7A	0.2L	16.1A	0.1L	35.0A	10.4L
10	0.0	0.6L	13.5A	1.9L	32.4A	7.7L
Average	0.4A	0.4L	15.1A	1.4L	37.0A	9.2L

Score on A target with 10-inch bull's-eye 82

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	EH	ES
	18.1	41.1	14.6	42.5

Mean for shots fired automatically (from center of impact of first shot in each burst) 26.2

AUTOMATIC ACCURACY TEST

DATE: 2 May 1957 RANGE: 100 yards

RIFLE: Caliber .30, T48, Serial Number 4085

CARTRIDGE: A.P., Caliber .30, T93E2, Lot LC12010

FIRING POSITION: Prone RIFLEMAN: Moore

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	1.4A	0.5R	19.5A	15.0L	15.1A	24.5L
2	1.7A	0.9R	6.4A	33.4L	17.0A	39.1L
3	1.9A	1.0R	18.9A	18.2L	14.1A	33.6L
4	1.3A	0.5R	10.6A	13.6L	10.9A	18.4L
5	1.9A	0.6R	10.0A	13.2L	0.5A	26.3L
6	2.9A	2.1R	14.8A	14.2L	5.9A	28.2L
7	0.7A	0.3L	10.0A	12.1L	6.0A	18.6L
8	1.4A	1.0R	12.1A	14.2L	1.7A	30.4L
9	1.3A	0.8L	10.2A	13.5L	8.0A	24.1L
10	1.9A	0.5L	24.2A	15.4L	28.4A	19.5L
Average	1.6A	0.5R	13.6A	16.3L	10.8A	26.3L

Score on A target with 10-inch bull's-eye 95

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	EH	ES
	17.5	27.7	41.2	43.5

Mean for shots fired automatically (from center of impact of first shot in each burst) 25.0

CONFIDENTIAL

AUTOMATIC ACCURACY TEST

DATE: 2 May 1957 RANGE: 100 yards

RIFLE: Caliber .30, T48, Serial Number 4085

CARTRIDGE: A.P., Caliber .30, T93E2, Lot LC12010

FIRING POSITION: Standing RIFLEMAN: Davis

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	5.6A	1.0R	54.3A	33.7R	156.3A	82.4R
2	0.8A	0.9R	49.6A	23.0R	148.6A	63.6R
3	4.9A	0.0	54.9A	28.1R	124.8A	66.6R
4	0.6A	2.4L	48.9A	23.9R	124.0A	62.8R
5	2.9A	0.4R	58.8A	25.8R	161.2A	63.0R
6	3.9A	0.5R	63.1A	28.8R	156.5A	69.4R
7	3.0A	0.5L	67.9A	32.6R	141.8A	72.8R
8	2.4A	1.1R	63.4A	30.1R	141.2A	73.2R
9	4.6A	1.7L	61.4A	35.7R	135.4A	82.5R
10	2.1A	0.3L	63.4A	34.1R	140.3A	76.0R
Average	3.1A	0.1L	58.6A	29.6R	143.0A	71.3R

Score on A target with 10-inch bull's-eye 49

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	RR	ES
	76.3	160.6	85.9	177.4

Mean for shots fired automatically (from center of impact of first shot in each burst) 110.1

CONFIDENTIAL

AUTOMATIC ACCURACY TEST

DATE: 2 May 1957 RANGE: 100 yards

RIFLE: Caliber .30, T48, Serial No. 4085

CARTRIDGE: A.P., Caliber .30, T93E2, Lot LC1200.0

FIRING POSITION: Standing RIFLEMAN: Girkout

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	2.7A	0.2R	45.8A	23.8L	115.1A	60.7L
2	2.5A	4.1L	47.0A	23.3L	122.6A	53.6L
3	3.9A	1.2L	43.2A	14.3L	102.7A	30.2L
4	2.6A	1.2L	50.4A	24.3L	114.6A	50.3L
5	4.0A	2.3L	46.8A	21.1L	108.9A	48.5L
6	2.6A	0.1L	55.2A	29.3L	137.9A	51.9L
7	1.0A	0.5L	51.5A	25.6L	134.5A	54.1L
8	2.3A	0.7R	51.2A	20.7L	121.6A	40.1L
9	1.5A	2.1L	49.8A	25.2L	117.0A	44.9L
10	2.9A	0.6L	42.5A	26.1L	109.7A	41.9L
Average	2.6A	1.1L	48.3A	23.4L	118.5A	47.6L

Score on A target with 10-inch bull's-eye 50

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	BH	BS
	61.6	136.9	61.4	147.0

Mean for shots fired automatically (from center of impact of first shot in each burst) 87.9

AUTOMATIC ACCURACY TEST

DATE: 2 May 1957 RANGE: 100 yards

RIFLE: Caliber .30, T48, Serial Number 4085

CARTRIDGE: A.P., Caliber .30, T93E2, Lot LC12010

FIRING POSITION: Standing RIFLEMAN: Moore

Fired in three-round bursts. Measurements are given in inches.

BURST NO.	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO SECOND SHOT		DISTANCE FROM TARGET CENTER TO THIRD SHOT	
	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
1	2.9A	2.0R	64.8A	21.8L	163.0A	59.9L
2	1.8A	0.5L	57.8A	19.2L	148.6A	48.4L
3	3.3A	1.2R	56.5A	18.2L	146.2A	45.4L
4	4.3A	0.4R	61.8A	14.9L	158.3A	33.1L
5	2.4A	0.5L	53.6A	14.2L	139.2A	42.9L
6	3.0A	2.2L	58.2A	15.9L	147.7A	36.5L
7	3.2A	0.8L	61.2A	16.2L	157.5A	33.9L
8	2.5A	2.1R	63.2A	14.0L	157.7A	33.1L
9	3.9A	0.2L	55.8A	17.4L	137.0A	36.2L
10	3.3A	1.6R	59.8A	14.1L	152.7A	27.6L
Average	3.1A	0.3R	59.3A	16.6L	150.8A	39.7L

Score on A target with 10-inch bull's-eye 50

30-SHOT GROUP	MEAN FROM CENTER OF TARGET	EV	ER	ES
	73.7	16[illegible].2	62.0	172.1

Mean for shots fired automatically (from center of impact of first shot in each burst) 106.1

ACCURACY TEST

DATE: 26 April 1957 *WIND: NNE to S, 0 to - mph
DIRECTION OF FIRE: SW SKY CONDITION: Scattered
FIRED FROM: Machine rest TEMPERATURE: 75° to 76°F.
RIFLE: Springfield, M1903, Serial Number 4747051, with Caliber .22 Accuracy Barrel Assembled.
CARTRIDGE: Ball, Caliber .22, T48

Target Measurements are Given in Inches.

Targets were obtained at 100 and 300 yards simultaneously.

	TARGET NO.	GROUP CENTER FROM TARGET CENTER	MR	MVD	MRD	EVD	RMD	EE
		RANGE: 100 yards						
	1		1.8	0.8	1.4	3.6	7.3	7.3
	2		1.3	0.6	1.0	2.1	4.8	5.0
	3		1.6	1.2	0.9	4.0	5.5	6.3
	4		2.4	1.1	2.0	5.2	7.6	8.6
	5		2.7	1.5	2.0	5.1	6.8	6.8
Average			2.0	1.0	1.5	4.2	6.4	6.8
		RANGE: 300 yards						
	1		5.6	2.6	4.5	11.5	21.8	21.8
	2		4.0	1.9	3.0	6.6	14.6	15.1
	3		5.0	3.8	2.6	12.4	16.8	18.9
	4		7.1	3.2	5.9	16.0	22.6	25.5
	5		8.2	4.6	6.2	19.1	20.5	20.6
Average			6.0	3.2	4.4	13.1	19.3	20.4

* Recorded at firing point.

ACCURACY TEST

DATE: 26 April 1957
DIRECTION OF FIRE: SW
FIRED FROM: Machine rest.
RIFLE: Code E, M70, Serial Number 304164, with Caliber .22 Carbine Accuracy Barrel Assembled.
CARTRIDGE: Ball, Caliber .22, Carbine.
*WIND: SE to SSW, 0 to 4 mph
SKY CONDITION: Scattered
TEMPERATURE: 74° to 76°F.

Target Measurements are Given in Inches.

Targets were obtained at 100 and 300 yards simultaneously.

TARGET NO.	MR	MVD	MHD	EVD	EHD	ES
			RANGE: 100 yards			
1	0.6	0.4	0.4	1.8	1.4	2.0
2	0.6	0.4	0.4	2.0	1.4	2.3
3	0.6	0.4	0.3	1.3	1.3	1.8
4	0.6	0.4	0.4	1.3	1.4	1.5
5	0.5	0.4	0.2	1.1	1.6	1.6
Average	0.6	0.4	0.3	1.5	1.4	1.8
			RANGE: 300 yards			
1	2.0	1.4	1.1	5.8	4.8	6.1
2	1.8	1.1	1.2	5.8	4.3	6.6
3	1.8	1.4	1.0	4.8	3.2	5.2
4	1.7	0.9	1.2	3.6	4.6	4.8
5	1.8	1.4	0.8	4.2	4.6	5.4
Average	1.8	1.2	1.1	4.8	4.3	5.6

* Recorded at firing point.

ACCURACY TEST

DATE: 7 May 1957
DIRECTION OF FIRE: SW
FIRED FROM: Bench rest
RIFLE: Caliber .22, T48, Serial Number 1616.
CARTRIDGE: Ball, Caliber .22, T48

*WIND: E to SW, 0 to 10 mph
SKY CONDITION: Scattered
TEMPERATURE: 74° to 77°F.

Target Measurements are Given in Inches

Targets were obtained at 100 and 300 yards simultaneously

RIFLEMAN	TARGET NO.	MR	MVD	MHD	EVD	EHD	ES
			RANGE: 100 yards				
Valentini	1	2.4	1.8	1.4	6.8	4.6	7.1
Valentini	2	2.9	1.7	2.1	7.8	9.0	9.6
Valentini	3	2.2	1.2	1.8	4.9	6.5	7.4
Davis	4	2.2	1.2	1.4	4.8	6.7	6.7
Davis	5	2.8	2.2	1.1	7.9	5.6	8.0
Average		2.5	1.6	1.6	6.4	6.5	7.7
			RANGE: 300 yards				
Valentini	1	7.2	5.4	4.2	19.8	13.5	20.9
Valentini	2	9.9	5.0	6.3	21.0	28.7	30.2
Valentini	3	6.8	3.8	5.5	14.4	19.7	20.8
Davis	4	6.5	3.6	4.4	14.3	20.7	20.7
Davis	5	8.3	6.6	3.6	23.6	16.9	23.8
Average		7.5	4.9	4.8	18.6	19.9	23.3

* Recorded at firing point.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Rifle, Code E, M70, Serial No. 367844 with Caliber .25 Test Barrel Manufactured by Code G 26 Apr 56			
		Cartridge, Ball, Caliber .25 with 75-Grain Bullet, Lot 74MC31 with full and reduced charges.			
		21 June 1957			
		VELOCITY TEST			
1307	4	4	SS	SAT	Fouling shots.
1312	6	10	SS	SAT	Full charge
1316	5	15	SS	SAT	41.0 grains propellant.
1325	5	20	SS	SAT	36.0 grains propellant.
1328	5	25	SS	SAT	26.0 grains propellant.
		ARMOR-VEST RETARDATION TEST			
		10 July 1957			
0844-0846	3	28	SS	SAT	Fouling shots.
0854-0906	6	34	SS	SAT	Full charge.
0916-0947	6	40	SS	SAT	38.0 grains propellant.
0950-1004	6	46	SS	SAT	25.5 grains propellant.
1007-1018	6	52	SS	SAT	21.5 grains propellant.
		26 July 1957			
0820-0835	4	56	SS	SAT	Fired to foul the bore and to check the instrumentation.
0848-0857	5	61	SS	SAT	30.5 grains propellant.

ACCURACY TEST

DATE: 7 May 1957 *WIND: SSE to WNW, 1 to 10 mph
DIRECTION OF FIRE: SW SKY CONDITION: Clear
FIRED FROM: Bench rest TEMPERATURE: 68° to 71°F.
CARBINE, Caliber .22, M2, Serial Number 7149237
CARTRIDGE: Ball, Caliber .22, Carbine

Target Measurements are Given in Inches.

Targets were obtained at 100 and 300 yards simultaneously.

RIFLEMAN	TARGET NO.	MR	MVD	MRD	EVD	ERD	ES
			RANGE: 100 yards				
Davis	1	1.3	1.0	0.6	3.2	2.5	3.8
Davis	2	1.2	0.7	0.9	2.4	3.8	4.0
Davis	3	1.6	1.0	1.2	3.7	3.6	4.4
Valentini	4	1.5	1.1	0.7	4.9	2.6	4.9
Valentini	5	1.1	0.7	0.6	3.4	2.7	3.8
Average		1.3	0.9	0.8	3.5	3.0	4.2
			RANGE: 300 yards				
Davis	1	4.0	3.1	2.1	10.8	8.8	12.4
Davis	2	3.8	2.1	2.8	8.2	11.9	12.4
Davis	3	6.1	2.9	5.1	13.6	16.4	17.2
Valentini	4	4.5	3.4	2.1	15.9	7.9	16.0
Valentini	5	3.5	2.0	2.3	8.9	9.6	10.8
Average		4.4	2.7	2.9	11.5	10.9	13.8

* Recorded at firing point.

FUNCTION REPORT

TIME	NO. RDS FIRED	TOTAL NO. OF RDS FIRED ON TEST	TYPE FIRE	FUNCTION	REMARKS
		Rifle, U.S., M1903, Serial Numbe 1515142 with Caliber .30 Accuracy Test Barrel Cartridge, Ball, Caliber .30, M2, Lot FA 4310 with full and reduced charges.			
		VELOCITY TEST			
		21 June 1957			
1102	3	3	SS	SAT	Fouling shots.
1108	5	8	SS	SAT	Full charge.
1110	5	13	SS	SAT	45.0 grains propellant.
1129	5	18	SS	SAT	40.0 grains propellant.
1134	5	23	SS	SAT	30.0 grains propellant.
1517	3	26	SS	SAT	Fouling shots.
1520	5	31	SS	SAT	43.0 grains propellant.
1525	5	36	SS	SAT	36.5 grains propellant.
1530	5	41	SS	SAT	29.5 grains propellant.
		ARMOR VEST RETARDATION TEST			
		2 July 1957			
0940	4	45	SS	SAT	Fouling shots.
0954	5	50	SS	SAT	Full charge.
1015	5	55	SS	SAT	43.0 grains propellant.
1028	7	62	SS	SAT	35.5 grains propellant.
1056	7	69	SS	SAT	28.0 grains propellant.
		Cartridge, Caliber .30 Loaded with 1st Duplex Bullet and Western Ball-Type Propellant, Lot AL-2796-45			
		9 July 1957			
		VELOCITY TEST			
1110	1	70	SS	SAT	25.0 grains propellant with Kapok wad.
1131-1135	4	74	SS	SAT	
1244-1248	5	79	SS	SAT	20.0 grains propellant with Kapok wad.
1251-1255	5	84	SS	SAT	15.0 grains propellant with Kapok wad.

ACCURACY TEST

DATE 9 May 1957 "WIND": ESE to SW, 2 to 10 mph
DIRECTION OF FIRE: SW SKY CONDITION: Scattered
FIRED FROM: Bench rest TEMPERATURE: 78° to 83°F.
RIFLE: Caliber .30, T48, Serial Number 4085
CARTRIDGE: A.P., Caliber .30 T93E2, Lot LC12010

Target Measurements are Given in Inches

Targets were fired at 100 and 300 yards simultaneously.

RIFLEMAN	TARGET NO.	MR	MVD	MHD	EVD	EHD	ES
			RANGE: 100 yards				
Valentini	1	2.6	2.0	1.3	9.3	6.2	9.8
Valentini	2	3.3	1.7	2.1	9.1	7.3	9.1
Valentini	3	2.4	1.3	1.8	5.4	6.0	6.8
Davis	4	3.9	2.4	2.7	9.1	9.5	11.3
Davis	5	3.7	1.7	2.9	8.3	11.0	11.3
Average		3.2	1.8	2.2	8.2	8.1	9.7
			RANGE: 300 yards				
Valentini	1	7.9	6.3	4.1	27.8	16.8	29.4
Valentini	2	9.9	4.6	6.6	26.9	24.2	27.6
Valentini	3	7.4	4.0	5.3	16.1	18.6	20.7
Davis	4	11.4	6.2	8.7	24.1	29.4	33.2
Davis	5	11.2	4.3	9.4	22.0	33.9	34.0
Average		9.6	5.1	6.9	23.4	24.6	29.0

* Recorded at firing point.

ACCURACY TEST

DATE: 9 May 1957
DIRECTION OF FIRE: SW
FIRED FROM: Benoa rest
*WIND: SE to SSW, 1 to 10 mph
SKY CONDITION: Clear to scattered
TEMPERATURE: 75° to 83°F.
CARBINE, Caliber .30, M2, Serial Number 7104306.
CARTRIDGE: Ball, Carbine, Caliber .30, M1, Lot LC-613769

Target Measurements are Given in Inches.

Targets were fired at 100 and 300 yards simultaneously.

RIFLEMAN	TARGET NO.	MR	MVD	MRD	RVD	XED	RS
			RANGE: 100 yards				
Davis	1	2.0	1.8	0.5	7.1	2.1	7.1
Davis	2	2.3	1.9	1.0	6.9	5.2	7.6
Davis	3	2.0	1.5	1.0	5.8	4.0	6.2
Valentini	4	2.1	1.8	0.8	6.2	3.5	6.4
Valentini	5	2.2	1.4	1.4	4.8	5.1	5.7
Average		2.1	1.7	0.9	6.2	4.0	6.6
			RANGE: 300 yards				
Davis	1	7.1	6.4	1.8	22.5	9.2	22.8
Davis	2	7.2	6.6	2.4	24.8	12.4	25.1
Davis	3	6.6	5.1	3.2	18.9	15.2	20.1
Valentini	4	7.6	6.5	2.8	21.6	11.6	22.2
Valentini	5	7.2	4.9	4.4	19.1	18.2	19.7
Average		7.1	5.9	2.9	21 4	13.3	22.0

*Recorded at firing point.

ACCURACY TEST

DATE: 7 August 1957 RANGE: 100 yards on Inclosed Range
FIRED FROM: Machine rest
CARTRIDGE: Caliber .22, Loaded with 50-Grain Full Patch Front Bullet for Caliber .22-06 Duplex Cartridge and 37.0 Grains of IMR 4895, Lot ALA2463 Propellant
RIFLE: Code E, M70, Serial Number 364827 with Caliber .22 Test Barrel.

Target Measurements are Given in Inches

SHOOTER: Davis

TARGET NO.	CENTER OF IMPACT FROM INDEX POINT	MR	MVD	MHD	EVD	EHD	RS
	3.9A						
1	3.1R	0.9	0.5	0.6	2.5	1.9	2.9
	3.8A						
2	3.2R	0.9	0.5	0.6	1.8	2.2	2.3
	3.8A						
3	3.5R	0.7	0.4	0.6	1.3	2.2	2.5
	3.7A						
4	3.9R	0.9	0.8	0.4	2.7	2.1	2.7
Average	3.8A						
	3.4R	0.8	0.6	0.6	2.1	2.1	2.6
40-Shot composite group					3.2	2.7	3.4

DATE: 10 and 12 June 1957 RANGE: 100 yards (Inclosed Range)
FIRED FROM: Machine rest
RIFLE: U.S., M1903, Serial Number 4747051 with Caliber .22 Accuracy Barrel
CARTRIDGE: Ball, Caliber .22, T48, with original bullet replaced with a similar bullet of a different lot.

Target Measurements are Given in Inches

TARGET NO.	MR	MVD	MHD	EVD	EHD	RS
1	0.5	0.4	0.2	1.9	1.0	2.0
2	0.8	0.4	0.6	2.8	1.7	2.9
3	0.8	0.6	0.4	2.1	1.8	2.1
4	1.0	0.6	0.7	2.3	2.5	2.8
Average	0.8	0.5	0.5	2.3	1.8	2.4

ACCURACY TEST

DATE: 10 and 12 June 1957 RANGE: 100 yards (Inclosed Range)
FIRED FROM: Machine rest
RIFLE: U.S., M1903, Serial Number 4747051 with Caliber .22 Accuracy Barrel
CARTRIDGE: Ball, Caliber .22, handloaded with bullet removed from the T48 round, 42 grains 4350 propellant, and WCC-9 primer.

Target Measurements are Given in Inches

TARGET NO.	MR	MVD	MRD	EVD	ERD	ES
	1.0	0.7	0.7	2.6	2.7	3.6
	1.5	1.1	0.7	4.7	4.0	5.0
	0.9	0.7	0.4	2.6	1.5	2.7
	0.9	0.5	0.7	2.0	3.3	3.6
Average	1.1	0.8	0.6	3.0	2.9	3.7

DATE: 13 June 1957 RANGE: 100 yards (Inclosed Range)
FIRED FROM: Machine rest
RIFLE: U.S., M1903, Serial Number 4747051 with Caliber .22 Accuracy Barrel.

Target Measurements are Given in Inches

TARGET NO.	MR	MVD	MRD	EVD	ERD	ES
Cartridge, Ball, Caliber .22, handloaded with WCC-9 primer, 68-grain bullet and 42 grains 4350 propellant.						
1	0.5	0.3	0.3	1.2	1.7	1.7
2	0.5	0.4	0.1	1.7	0.5	1.7
Average	0.5	0.4	0.2	1.4	1.1	1.7
Cartridge, Ball, Caliber .22, handloaded with propellant removed from T48 round, WCC-9 primer, and 68-grain bullet.						
1	0.8	0.4	0.6	1.5	1.8	1.9
2	1.3	0.9	0.9	3.1	3.7	4.5
Average	1.0	0.6	0.8	2.3	2.8	3.2

DATE: 27 May 1957
DIRECTION OF FIRE: SW
RIFLE: U.S., Caliber .30, M1, Modified
CARTRIDGE: Ball, Caliber .30, Duplex
FIRED FROM: Machine rest

*WIND: SSE to SSW, 0 to 8 mph
SKY CONDITION: Overcast
TEMPERATURE: 71 to 74°F

All Target Data are Given in Inches

TARGET NUMBER	FIRST SHOTS MR	MVD	MRD	EVD	ERD	ES	ALL SHOTS MR**	MVD	MRD	ES
	Rifle No. 5973453									
				100-Yard Targets						
1	1.8	1.1	1.2	5.3	3.8	6.2	12.6	20.5	18.7	21.2
2	2.2	1.6	1.3	8.9	4.8	10.1	10.2	19.2	21.2	22.7
3	1.4	1.0	0.7	4.3	3.9	4.8	11.2	20.0	16.9	20.4
4	1.8	1.3	1.0	5.1	4.0	5.1	9.1	17.5	17.5	19.1
Average	1.8	1.2	1.0	5.9	4.1	6.6	10.8	19.3	18.6	20.8
				300-Yard Targets						
1	5.6	3.7	3.4	17.6	11.6	18.8	36.4	59.8	54.1	63.7
2	7.1	5.0	3.9	25.3	14.7	28.5	30.7	54.6	67.2	69.7
3	4.9	3.8	2.2	13.8	11.6	15.0	32.0	57.4	52.2	61.1
4	5.9	4.6	3.0	16.9	10.8	17.1	27.3	53.6	54.1	58.9
Average	5.9	4.3	3.1	18.4	12.2	19.8	31.6	56.4	56.9	63.4
	Rifle No. 5977047									
				100-Yard Targets						
1	2.4	2.2	0.7	7.9	3.3	8.3	7.3	15.7	13.6	16.8
2	1.6	1.1	1.0	3.9	5.2	5.9	8.9	18.3	17.8	19.1
3	2.0	1.6	1.1	4.6	3.4	5.3	9.0	21.9	14.3	22.0
4	1.9	1.1	1.2	4.9	4.3	5.2	8.2	20.9	14.1	21.0
Average	2.0	1.5	1.0	5.3	4.0	6.2	8.4	19.2	15.0	19.7
				300-Yard Targets						
1	7.0	6.5	2.0	24.8	8.2	25.0	22.4	47.3	41.5	53.2
2	4.6	3.0	2.8	11.8	16.4	18.1	26.9	56.3	55.1	57.7
3	6.8	5.4	3.4	15.2	10.8	16.4	26.6	61.3	43.8	62.8
4	5.8	3.7	3.4	17.6	12.0	18.0	24.2	62.2	42.9	63.2
Average	6.0	4.6	2.9	17.4	11.8	19.4	25.0	56.8	45.8	59.2

* Recorded at firing point.
** From the center of impact of the first shot in each round.

DATE: 27 May 1957
DIRECTION OF FIRE: SW
RIFLE: U.S., Caliber .30, M1, Modified
CARTRIDGE: Ball, Caliber .30, Triplex
FIRED FROM: Machine rest

*WIND: NE to SSW, 0 to 11 mph
SKY CONDITION: Overcast
TEMPERATURE: 71 to 74°F

All Target Data are Given in Inches

When one or more shots missed the target, the measurements given are for the shots which hit the target.

TARGET NUMBER	FIRST SHOTS						ALL SHOTS				
	MR	MVD	MHD	EVD	EHD	ES	MR		EVD	EHD	ES
	Rifle No. 5973453										
				100-Yard Targets							
1	8 shots hit target			9.3	9.8	11.2	27 shots hit target		24.1	44.7	45.0
2	8 shots hit target			10.4	25.7	25.8	27 shots hit target		22.8	41.3	41.3
3	9 shots hit target			11 .0	21.4	21.8	27 shots hit target		45.4	34.1	47.2
4	9 shots hit target			13.7	22.2	24.9	27 shots hit target		41.8	26.5	42.3
				300-Yard Targets							
1	8 shots hit target			31.4	31.0	39.3	27 shots hit target		76.5	98.2	98.4
2	9 shots hit target			33.2	82.5	82.6	26 shots hit target		142.7	101.5	145.5
3	9 shots hit target			36.0	69.6	71.0	27 shots hit target		119.0	106.2	152.8
4	9 shots hit target			67.4	44.2	76.9	27 shots hit target		121.6	121.8	169.0
	Rifle No. 5977047										
				100-Yard Targets							
1	9 shots hit target			11.7	10.1	13.3	28 shots hit target		38.5	22.0	38.6
2	9 shots hit target			13.6	12.9	15.5	28 shots hit target		36.3	35.7	36.4
3	9 shots hit target			34.3	33.7	39.5	29 shots hit target		34.3	45.6	50.7
4	8.0	4.8	5.4	23.2	34.1	36.6	29 shots hit target		37.6	39.6	53.9

*, Recorded at Firing Point.

DATE: 27 May 1957
DIRECTION OF FIRE: SW
RIFLE: U.S., Caliber .30, M1, Modified
CARTRIDGE: Ball, Caliber .30, Triplex
FIRED FROM: Machine rest

*WIND: NE to SSW, 0 to 11 mph
SKY CONDITION: Overcast
TEMPERATURE: 71 to 74°F

All Target Data are Given in Inches

When one or more shot missed the target, the measurements given are for the shots which hit the target.

TARGET NUMBER	FIRST SHOTS				ALL SHOTS			
	MR	MVD	EVD	MRD	ERD	ES	MR	EVD	ERD	ES
	Rifle No. 5977047									
				300-Yard Targets						
1	8 shots hit target		37.7	32.7	41.7		28 shots hit target	94.7	117.4	119.1
2	9 shots hit target		37.7	40.7	43.8		29 shots hit target	128.1	100.6	137.8
3	9 shots hit target		36.3	119.1	123.2		29 shots hit target	114.3	135.6	156.2
4	9 shots hit target		39.1	35.0	44.3		28 shots hit target	73.2	63.5	85.2

6 x 6-foot target at 100 yards.
15 x 15-foot target at 300 yards.

* Recorded at firing point.

DATE: 11 June 1957
DIRECTION OF FIRE: S
RIFLE: U.S., Caliber .30, M1, Modified, Serial No. 5977047
CARTRIDGE: Ball, Caliber .30, Triplex
FIRED FROM: Bench rest

RANGE: 50 yards
RIFLEMAN: Davis

All Target Data are Given in Inches

TARGET NUMBER	FIRST SHOTS						ALL SHOTS			
	MR	MVD	MRD	EVD	ERD	ES	MR*	EVD	ERD	ES
1	7.5	6.5	3.1	43.0	18.0	44.1	7.0	43.0	30.5	50.3
2	7.7	7.0	2.7	24.7	14.6	24.7	9.2	32.2	21.7	32.6
3	6.8	4.7	3.7	33.7	13.4	36.3	6.5	33.7	28.3	36.3
4	10.5	8.8	4.4	47.5	24.5	49.4	7.8	53.4	32.6	56.9
Average	8.1	6.8	3.5	37.2	17.6	38.6	7.6	40.6	28.3	43.8

* From the center of impact of the first shot in each round.

ACCURACY TEST

DATE: 11 June 1957 RANGE: 50 Yards
RIFLE: U.S., Caliber .30, M1, Modified, Serial Number 5077047
CARTRIDGE: Ball, Caliber .30, Triplex
FIRING POSITION: Bench rest RIFLEMAN: Davis
TARGET NO.: 2

Measurements are Given in Inches

ROUND NUMBER	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER TO TRAILING SHOT*		DISTANCE FROM TARGET CENTER TO TRAILING SHOT*	
	VERTICAL	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL	HORIZONTAL
1	13.2A	5.0R	10.4A	15.4L	7.5B	0.8R
2	6.0B	2.2R	7.8B	0.3L	8.6B	1.3L
3	0.8B	0.5L	4.1B	3.1L	5.4B	2.9R
4	9.7B	3.0L	6.3B	0.6L	5.4B	0.7R
5	5.3B	1.6R	1.3B	0.0	7.2B	4.9R
6	8.9B	1.1R	3.0B	4.0L	0.8A	0.6R
7	10.4B	0.8R	1.4B	1.4L	3.2A	0.2L
8	29.8B	15.0R	12.7B	13.1R	2.0B	0.3L
9	8.0B	1.6R	8.8B	0.3L	14.0B	5.4L
10	12.6B	1.3L	1.0B	2.0L	0.3B	2.7R
Average	7.8B	2.2R	3.6B	1.4L	4.6B	0.5R

* The second and third shots in each round were not identified.

TARGET NO.: 3

1	7.6B	1.8L	5.6B	1.2L	7.0B	13.5L
2	5.8B	2.5R	2.2B	5.0R	14.6B	3.6R
3	7.5B	0.1R	7.8B	2.3L	5.0B	6.3L
4	23.0B	11.1L	17.6B	2.0L	4.5B	0.0
5	8.6B	2.1R	8.2B	5.4L	2.8B	7.7L
6	30.6B	3.1R	30.2B	3.4R	1.5B	0.7R
7	7.2B	0.1R	11.1B	0.7R	1.6A	1.4R
8	18.0B	1.5L	25.7B	16.4L	1.4B	1.3L
9	8.1B	0.2R	10.6B	5.6L	5.5B	5.2R
10	5.9B	3.4R	6.2B	0.4R	11.6B	5.4L
Average	12.2B	0.3L	12.5B	2.3L	5.7B	2.3L

* The second and third shots in each round were not identified.

ACCURACY TEST

DATE: 11 June 1957 RANGE: 50 Yards
RIFLE: U.S., Caliber .30, M1, Modified, Serial Number 5977047
CARTRIDGE: Ball, Caliber .30, Triplex
FIRING POSITION: Bench rest RIFLEMAN: Davis
TARGET NO.: 4

Measurements are Given in Inches

ROUND NUMBER	DISTANCE FROM TARGET CENTER TO FIRST SHOT		DISTANCE FROM TARGET CENTER - TRAILING SHOT*		DISTANCE FROM TARGET CENTER TO TRAILING SHOT*	
	VERTICAL	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL	HORIZONTAL
1	7.2B	1.5R	13.7B	3.4L	2.0B	2.2L
2	5.5B	1.4R	8.4B	1.4R	4.1B	0.6R
3	4.7B	10.2L	7.2A	11.4L	2.5B	2.0R
4	5.8B	2.2R	7.0B	3.0L	7.0B	1.2R
5	10.0B	1.8L	1.5B	8.0R	1.3B	2.0L
6	17.7A	10.5L	2.9A	16.0L	4.2B	0.0
7	4.7B	1.2R	12.7B	0.8L	0.1A	0.4R
8	9.0B	0.8R	0.5A	2.5R	4.5B	0.0
9	16.0B	2.9R	3.3B	5.5L	10.8B	12.3R
10	3.9B	1.2L	5.4B	5.3R	0.5B	2.9R
Average	5.1B	1.4L	4.1B	2.3L	3.7B	1.5R

* The second and third shots in each round were not identified.

TARGET NO.: 5

1	30.6A	2.5L	15.1A	16.9L	2.8B	2.1R
2	5.0B	3.4R	0.5B	4.9L	14.8A	4.2L
3	6.4B	1.4L	5.6B	3.7R	2.0B	3.9L
4	6.7B	1.0L	7.3B	3.7R	0.6B	2.2L
5	3.1B	3.4R	4.7B	0.7R	1.5A	0.5R
6	6.3B	1.9L	6.6B	0.2R	4.7B	3.7R
7	16.9B	11.4R	22.8B	14.6R	2.6B	0.8L
8	3.2A	3.8L	1.5B	2.0L	1.3B	0.1R
9	8.2A	13.1L	6.4B	3.1R	11.6B	18.0L
10	5.4B	2.7R	12.3B	3.3L	0.3B	2.1L
Average	0.8B	0.3L	5.3B	0.1L	1.0B	2.5L

* The second and third shots in each round were not identified.

RETARDATION TEST

DATE 2 July 1957
TARGET Vest, Armor, M1953
RIFLE U.S., M1903, Serial No. 1515142 with Caliber .30 Accuracy Test Barrel
CARTRIDGE Ball, Caliber .30, M2, Lot PA 4310 with full and reduced charges

AMMUNITION TEMPERATURE 70°F RANGE TEMPERATURE 70 to 73°F DENSITY .995 to .988

DISTANCE BETWEEN MUZZLE AND TARGET(ft) 55
DISTANCE FROM MUZZLE TO INITIATORS(ft) S_1 = 20, S_2 = 50, S_3 = 58, S_4 = 68, S_5 = 78

		VELOCITY (feet per second)						
ROUND NO.	TIME	AT 35 ft*	AT 55 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	RETARDATION	REMARKS
				FULL CHARGE				
46	0954	2778	2763	2740	2717	2758	5	
47	0958	2783	2768	2740	2725	2752	16	
48	1001	2788	2773	2747	2732	2759	14	
49	1003	2804	2789	2762	2740	2780	9	
50	1005	2760	2745	2725	2703	2743	2	
Average		2783	2768	2743	2723	2758	9	
				43.0 GRAINS PROPELLANT				
51	1015	2406	2392	2364	2347	2378	14	
52	1017	2417	2403	2381	2364	2395	8	
53	1018	2451	2437	2410	2392	2424	13	
54	1022	2394	2380	2353	2336	2367	13	
55	1025	2373	2359	2336	2320	2349	10	
Average		2408	2394	2369	2352	2383	12	
				35.5 GRAINS PROPELLANT				
57	1031	1947	1933	1901	1887	1912	21	Rounds 56 and 58
59	1037	2017	2003	1972	1957	1984	19	hit previous shot
60	1039	2000	1986	1957	1942	1969	17	holes.
61	1051	2082	2068	2041	2024	2055	13	
62	1053	2024	2010	1984	1969	1996	14	
Average		2014	2000	1971	1956	1983	17	
				28.0 GRAINS PROPELLANT				
64	1058	1598	1580	1541	1527	1552	28	Velocity not recorded on rim [illegible]67.
65	1104	1539	1527	1486	1473	1496	31	
66	1106	1568	1556	1522	1508	1533	23	
68	1122	1537	1525	1490	1479	1499	26	Bullets ejected after perforating armor vest.
69	1125	1551	1539	1495	1477	1509	30	
Average		1557	1545	1507	1493	1518	28	

* Instrumental velocity ** Calculated velocity

RETARDATION TEST

DATE 2 July 1957
TARGET Vest Armor, M1953
RIFLE Code S, M70, Serial No. 367368 with Caliber .27 Test Barrel
CARTRIDGE Ball, Caliber .27, with 95-Grain Bullet, Lot 661462 with full and reduced charges

AMMUNITION TEMPERATURE 70°F RANGE TEMPERATURE 75 to 78°F DENSITY .985 to .979

DISTANCE BETWEEN MUZZLE AND TARGET(ft) 55
DISTANCE FROM MUZZLE TO INITIATORS(ft) S_1 = 20, S_2 = 50, S_3 = 58, S_4 = 68, S_5 = 78

		VELOCITY (feet per second)						
ROUND NO.	TIME	AT 35 ft*	AT 55 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	RETARDATION	REMARKS
				FULL CHARGE				
27	1307	3138	3117	3077	3058	3092	25	Round 26 hit previous shot hole.
28	1309	3165	3144	3115	3077	3145	-1	
29	1311	3254	3233	3205	3175	3229	4	
30	1313	3128	3107	3077	3049	3099	8	
31	1315	3125	3104	3067	3049	3081	23	
Average		3162	3141	3108	3082	3129	12	
				37.5 GRAINS PROPELLANT				
32	1317	2793	2772	2732	2703	2755	17	
34	1327	2854	2833	2786	2755	2811	22	Velocity not recorded on rds 33 and 36
35	1329	2793	2772	2710	2653	2756	16	
37	1340	2773	2752	2695	2646	2734	18	Bullets keyholed after perforating armor vest.
38	1343	2757	2736	2703	2674	2726	10	
Average		2794	2773	2725	2686	2756	17	
				31.0 GRAINS PROPELLANT				
39	1359	2368	2348	2309	2288	2326	22	Velocity not recorded on rd 42
40	1401	2347	2327	2288	2262	2309	18	
41	1403	2327	2307	2268	2237	2293	14	Round 43 hit previous shot hole.
44	1417	2351	2331	2294	2273	2311	20	
45	1419	2351	2331	2294	2268	2315	16	
Average		2349	2329	2291	2266	2311	18	
				23.0 GRAINS PROPELLANT				
47	1427	1662	1645	1575	1543	1601	44	Velocity not recorded on rds 46, 49, 50 and 51.
48	1430	1734	1717	1645	1610	1673	44	
52	1500	1761	1744	1681	1650	1706	38	
53	1502	1729	1712	1653	1626	1675	37	
54	1504	1686	1669	1621	1605	1634	35	
Average		1714	1697	1635	1607	1658	40	

* Instrumental velocity ** Calculated velocity

RETARDATION TEST

DATE 3 July 1957
TARGET Vest Armor, M1953
RIFLE, Code E, M70, Serial No. 364827 with Caliber .22 Test Barrel
CARTRIDGE Ball, Caliber .22 with 50-Grain Bullet, Lot 10LK4 with full and reduced charges.

AMMUNITION TEMPERATURE 70°F RANGE TEMPERATURE 73 to 84°F. DENSITY .995 to .973
MID-RANGE BETWEEN MUZZLE AND TARGET(ft) 55
DISTANCE FROM MUZZLE TO INITIATORS(ft) S_1 = 20, S_2 = 50, S_3 = 58, S_4 = 68, S_5 = 78

		VELOCITY (feet per second)						
ROUND NO.	TIME	AT 35 ft*	AT 55 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	RETARDATION	REMARKS
				FULL CHARGE				
51	0904	3841	3813	3774	3745	3797	16	Bullets keyholed after perforating armor vest.
52	0906	3891	3863	3802	3745	3848	15	
53	0908	3861	3833	3774	3731	3808	25	
54	0910	3876	3848	3802	3774	3824	24	
55	0912	3861	3833	3774	3704	3830	23	
Average		3870	3842	3785	3740	3821	21	
				41.0 GRAINS PROPELLANT				
56	0914	3401	3373	3236	3115	3333	40	Velocity not recorded on rd 59.
57	0916	3394	3366	3268	3185	3334	32	
58	0918	3398	3370	3279	3195	3346	24	Bullet keyholed after perforating armor vest.
60	0924	3481	3452	3367	3300	3421	31	
61	1004	3378	3350	3289	3226	3339	11	
Average		3410	3382	3288	3204	3355	28	
				31.5 GRAINS PROPELLANT				
62	1006	2747	2721	2625	2538	2695	26	Velocity not recorded on rds 65, 66, 67, 68 and 69
63	1008	2591	2565	2469	2387	2535	30	
64	1010	2604	2578	2481	2404	2543	35	
70	1114	2710	2684	2577	2494	2643	41	Bullets keyholed after perforating armor vest.
71	1116	2700	2674	2571	2494	2633	41	
Average		2670	2644	2545	2463	2610	35	
				21.0 GRAINS PROPELLANT				
76	1256	1755	1733	1653	1605	1591	42	Velocity not recorded on rds 72, 73, 74, 75, 77, 79, 82 and 83.
78	1305	1742	1720	1616	1546	1672	48	
80	1310	1634	1612	1538	1497	1571	41	
81	1318	1689	1667	1572	1515	1618	49	Bullets keyholed after perforating armor vest.
84	1330	1733	1711	1639	1582	1685	26	
Average		1711	1689	1604	1549	1647	41	

* Instrumental velocity ** Calculated velocity

AD 155261

RETARDATION TEST

DATE 5 July 1957
TARGET Vest, Armor, M1953
RIFLE, Code E, M70, Serial No. 304164 with Caliber .22 Carbine Test Barrel
CARTRIDGE, Ball, Caliber .22, Carbine with 41-Grain Bullet with full and reduced charges.

AMMUNITION TEMPERATURE 70°F. RANGE TEMPERATURE 78 to 90°F. DENSITY .948 to .947

DISTANCE BETWEEN MUZZLE AND TARGET(ft) 55
DISTANCE FROM MUZZLE TO INITIATORS(ft) S_1 = 20, S_2 = 50, S_3 = 58, S_4 = 68, S_5 = 78

		VELOCITY (feet per second)						
ROUND NO.	TIME	AT 35 ft*	AT 55 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	RETARDATION	REMARKS
				FULL CHARGE				
338	1250	3015	2977	2899	2841	2945	32	Velocity not recorded on rds
340	1254	3021	2983	2933	2882	2974	9	341, 342 & 345.
343	1302	2938	2900	2857	2817	2889	11	Round 339 hit a previous shot hole.
344	1304	3012	2974	2915	2857	2961	13	
346	1308	2979	2941	2890	2857	2916	25	
Average		2993	2955	2899	2851	2937	18	
				11.0 GRAINS PROPELLANT				
347	1315	2417	2384	2331	2284	2361	23	
348	1317	2166	2133	2070	2028	2104	29	
349	1319	2098	2065	2004	1969	2032	33	
350	1321	2379	2346	2294	2252	2328	18	
351	1323	2125	2092	2028	1988	2060	32	
Average		2237	2204	2145	2106	2177	27	
				6.5 GRAINS PROPELLANT				
352	1325	1684	1659	1590	1560	1614	45	Velocity not recorded on rd 354.
353	1327	1511	1486	1418	1383	1435	51	
356	1333	1610	1585	1490	1435	1534	51	Rds 335 and 357 hit previous
358	1357	1566	1541	1473	1447	1494	47	shot holes.
359	1359	1561	1536	1443	1410	1469	67	
Average		1586	1561	1482	1447	1509	52	
				2.5 GRAINS PROPELLANT				
360	1401	Lost		Lost	Lost			Partial penetration of vest.
361	1403	Lost		Lost	Lost			Bullet hit second initiator.
362	1405	Lost		Lost	Lost			Bullet did not leave bore.
363	1407	Lost		Lost	Lost			Bullet did not leave bore.
364	1409	Lost		Lost	Lost			Bullet did not leave bore.
Average								

* Instrumental velocity ** Calculated velocity

RETARDATION TEST

DATE 5 July 1957
TARGET Vest, Armor, M1953
RIFLE, U.S., Caliber .30, M1903, Serial No. 4747051 with Caliber .22 Test Barrel.
CARTRIDGE, Ball, Caliber .22, T48 with full and reduced charges.

AMMUNITION TEMPERATURE 70°F. RANGE TEMPERATURE 90 to 93°F DENSITY .947 to .952

DISTANCE BETWEEN MUZZLE AND TARGET(ft) 55
DISTANCE FROM MUZZLE TO INITIATORS(ft) S_1 = 20, S_2 = 50, S_3 = 58, S_4 = 68, S_5 = 78

		VELOCITY (feet per second)						
ROUND NO.	TIME	AT 35 ft*	AT 55 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	RETARDATION	REMARKS
				FULL CHARGE				
358	1440	3322	3305	3215	3106	3302	3	Rd 360 hit previous shot hole.
359	1442	3344	3327	3247	3135	3337	-10	
361	1446	3311	3294	3165	3030	3273	21	Bullets keyholed after perforating armor vest.
362	1448	3341	3324	3289	3257	3315	9	
363	1450	3356	3339	3236	3115	3333	6	
Average		3335	3318	3230	3129	3312	6	
				39.5 GRAINS PROPELLANT				
364	1453	2988	2972	2865	2755	2953	19	Bullets keyholed after perforating armor vest.
365	1455	3033	3017	2915	2809	3000	17	
366	1457	3080	3063	2959	2841	3053	10	
367	1459	3061	3045	2985	2910	3045	0	
368	1501	2994	2978	2849	2732	2943	35	
Average		3031	3015	2915	2809	2999	16	
				35.0 GRAINS PROPELLANT				
369	1503	2793	2777	2688	2591	2766	11	Bullets keyholed after perforating armor vest.
370	1505	2879	2863	2747	2632	2839	24	
371	1507	2836	2820	2747	2681	2800	20	
372	1509	2844	2828	2740	2639	2821	7	
373	1511	2613	2597	2500	2392	2586	11	
Average		2793	2777	2684	2587	2762	15	
				29.5 GRAINS PROPELLANT				
374	1513	2355	2340	2278	2217	2327	13	Velocity not recorded on rds 375, 379, 381, 382 and 383.
377	1519	2322	2307	2242	2183	2289	18	
378	1521	2273	2258	2174	2096	2236	22	Round 376 hit previous shot hole.
380	1530	2385	2370	2278	2203	2338	32	
384	1548	2370	2355	2278	2203	2338	17	Bullets keyholed after perforating armor vest.
Average		2341	2326	2250	2180	2306	20	

* Instrumental velocity ** Calculated velocity

RETARDATION TEST

DATES 10 and 26 July 1957
TARGET Vest, Armor, M1953
RIFLE, Cole E, M70, Serial No. 304164 with Caliber .22 Carbine Test Barrel
CARTRIDGE, Ball, Caliber .22, Carbine with 41-Grain Bullet with full and reduced charges.

AMMUNITION TEMPERATURE 70°F RANGE TEMPERATURE 75 to 77°F. DENSITY .984 to .985

DISTANCE BETWEEN MUZZLE AND TARGET (ft) 55
DISTANCE FROM MUZZLE TO INITIATORS(ft) S_1 = 20, S_2 = 50, S_3 = 58, S_4 = 68, S_5 = 78

		VELOCITY (feet per second)					
ROUND NO.	TIME	AT 35 ft*	AT 55 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	REMARKS
	10 July 1957			3.5 GRAINS PROPELLANT			
365	1053	961	952	Lost	Lost		Bullets, after perforating armor vest, did not pass through remaining initiators.
366	1056	945	937	Lost	Lost		
367	1105	1005	995	Lost	Lost		
368	1107	935	927	Lost	Lost		
369	1112	932	924	Lost	Lost		
Average		956	947				
	26 July 1957			3.5 GRAINS PROPELLANT			
380	1030	856		Lost	Lost		Bullets, after perforating armor vest, did not pass through remaining initiators.
381	1034	926		Lost	Lost		
382	1038	848		Lost	Lost		
383	1044	803		Lost	Lost		
384	1048	832		Lost	Lost		
Average		853					

* Instrumental velocity ** Calculated velocity

RETARDATION TEST

DATE 10 July 1957
TARGET Vest, Armor, M19[illegible]3
RIFLE Code E, M70, Serial No. 367844 with Caliber .25 Test Barrel
CARTRIDGE Ball, Caliber .25, with 75-Grain Bullet, Lot 74MC3L with full and reduced charges
AMMUNITION TEMPERATURE 70°F RANGE TEMPERATURE 74 to 75°F. Density .99[illegible]
DISTANCE BETWEEN MUZZLE AND TARGET (ft) 55
DISTANCE FROM MUZZLE TO INITIATORS(ft) S_1 =20, S_2 = 50, S_3 = 58, S_4 = 68, S_5 = 78

		VELOCITY (feet per second)						
ROUND NO.	TIME	AT 35 ft*	AT 55 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	RETARDATION	REMARKS
				FULL CHARGE				
29	0854	3448	3423	3390	3356	3417	6	Velocity not recorded on rd 33.
30	0857	3472	3447	3401	3378	3419	28	
31	0859	3468	3443	3390	3367	3408	35	Bullets keyholed after perforating armor vest.
32	0901	3488	3463	3367	3311	3412	51	
34	0906	3468	3443	3413	3378	3441	9	
Average		3469	3444	3392	3358	3419	24	
				38.0 GRAINS PROPELLANT				
35	0916	2820	2795	2740	2703	2770	25	Bullets keyholed after perforating armor vest.
36	0918	3018	2993	2924	2890	2951	42	
37	0920	2970	2945	2857	2817	2889	56	
39	0929	2997	2972	2924	2907	2938	34	Velocity not recorded on rd 38.
40	0947	2997	2972	2915	2899	2928	44	
Average		2960	2935	2872	2843	2895	40	
				25.5 GRAINS PROPELLANT				
42	0955	1859	1839	1783	1770	1793	46	Velocity not recorded on rd 41.
43	0957	1866	1846	1789	1773	1802	44	
44	1000	1911	1891	1842	1821	1859	32	Bullets keyholed after perforating armor vest.
45	1002	2013	1992	1934	1923	1943	49	
46	1004	2068	2047	1908	1965	2006	41	
Average		1943	1923	1867	1850	1881	42	
				21.5 GRAINS PROPELLANT				
47	1007	1609	1591	1538	1529	1545	46	Velocity not recorded on rd 48.
49	1012	1640	1622	1572	1553	1587	35	
50	1014	1[illegible]70	1592	1527	1511	1540	42	Bullet keyholed after perforating armor vest.
51	1016	[illegible]671	1653	1600	1585	1612	41	
52	1018	1576	1558	1506	1488	1520	33	
Average		1619	1601	1549	1533	1561	40	

* Instrumental Velocity ** Calculated Velocity

RETARDATION TEST

DATE 11 July 1957
TARGET Vest, Armor, M1953
RIFLE Code E, M70, Serial No. [illegible]827 with Caliber .22 Test Barrel
CARTRIDGE Caliber .22, Loaded with 50-Grain Full Patch Front Bullets for Caliber .22-06 Duplex Cartridge and IMR No. 4895 Propellant, Lot AA4. 2425

AMMUNITION TEMPERATURE 70°F. RANGE TEMPERATURE 78 to 79°F. DENSITY .978 to .982

DISTANCE BETWEEN MUZZLE AND TARGET(ft) 55
DISTANCE FROM MUZZLE TO INITIATORS(ft) S_1 =20, S_2 = 50, S_3 = 58, S_4 = 68, S_5 = 78

ROUND NO.	TIME	VELOCITY (feet per second) AT 35 ft*	AT 55 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	RETARDATION	REMARKS
				FULL CHARGE				
120	1408	3623	3592	3497	3413	3564	28	Velocity not recorded on rd 122
121	1411	3580	3549	3472	3448	3491	58	
123	1416	3641	3610	3546	3509	3576	34	
124	1418	3619	3588	3521	3484	3552	37	
125	1422	3641	3610	3472	3367	3556	54	
Average		3621	3590	3502	3444	3548	42	
				28.5 GRAINS PROPELLANT				
126	1428	2854	2825	2770	2755	2782	43	Round 126 hit a previous shot hole.
127	1433	2871	2841	2762	2710	2804	37	
129	1438	2901	2871	2817	2809	2823	48	Bullets keyholed after perforating armor vest.
130	1440	2895	2869	2770	2710	2818	51	
131	1446	2890	2860	2786	2732	2829	31	
Average		2883	2853	2781	2743	2811	42	
				20.0 GRAINS PROPELLANT				
132	1448	2114	2089	2028	2012	2041	48	Bullets keyholed after perforating armor vest.
133	1450	2101	2076	1988	1946	2022	54	
134	1452	2069	2044	1957	1916	1990	54	
135	1454	2063	2038	1965	1934	1990	48	
136	1456	2068	2043	1980	1946	2007	36	
Average		2083	2058	1984	1951	2010	48	
				12.0 GRAINS PROPELLANT				
137	1458	1563	1542	1437	1408	1460	82	Bullets keyholed after perforating armor vest.
138	1500	1803	1780	1704	1681	1722	58	
139	1501	1596	1574	1499	1479	1515	59	
140	1503	1612	1590	1508	1481	1530	60	
141	1505	1792	1769	1701	1675	1722	47	
Average		1673	1651	1570	1545	1590	51	

* Instrumental velocity ** Calculated velocity

RETARDATION TEST

DATE 12 July 1957
TARGET Vest, Armor, M1953
RIFLE U.S., Caliber .30, M1903, Serial No. 1515142 with Caliber .30 Accuracy Test Barrel
CARTRIDGE Caliber .30, Loaded with 1st Duplex Bullet and Western Ball-Type Propellant, Lot AL-2796-45, with full and reduced charges.

AMMUNITION TEMPERATURE 70°F. RANGE TEMPERATURE 83 to 85°F. DENSITY .966 to .962

DISTANCE BETWEEN MUZZLE AND TARGET(ft) 55
DISTANCE FROM MUZZLE TO INITIATORS(ft) S_1 = 20, S_2 = 50, S_3 = 58, S_4 = 68, S_5 = 78

		VELOCITY (feet per second)						
ROUND NO.	TIME	AT 35 ft*	AT 55 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	RETARDATION	REMARKS
				25.0 GRAINS PROPELLANT				
114	1324	2588	2554	2475	2457	2489	65	Velocity not recorded on rds 116 and 119.
115	1327	2564	2530	2469	2451	2483	47	Round 117 hit a previous shot hole.
118	1337	2586	2552	2475	2445	2499	53	
120	1358	2562	2528	2469	2451	2483	45	
121	1402	2555	2521	2475	2445	2499	22	
Average		2571	2537	2473	2450	2491	46	
				16.0 GRAINS PROPELLANT				
122	1418	1824	1796	1736	1721	1748	48	
123	1420	1882	1854	1786	1770	1799	55	
124	1422	1893	1864	1802	1783	1817	47	
125	1424	1877	1849	1789	1773	1802	47	
126	1426	1866	1838	1779	1761	1793	45	
Average		1868	1840	1778	1762	1792	48	
				10.0 GRAINS PROPELLANT				
127	1428	1282	1263	1170	1167	1172	91	
128	1430	1293	1274	1192	1181	1201	73	
129	1432	1258	1240	1155	1144	1164	76	
130	1434	1285	1266	1190	1178	1200	66	
131	1436	1251	1233	1163	1153	1171	62	
Average		1274	1255	1174	1165	1182	74	
				7.0 GRAINS PROPELLANT				
134	1459	1000	992	790	782	796	196	
137	1517	1287	1268	814	808	819	449	
139	1521	1036	1028	869	864	873	155	Velocity not recorded on rds 132, 133, 135 and 138.
140	1523	1124	1111	965	960	969	142	
141	1535	1172	1157	939	932	945	212	
Average		1124	1111	875	869	880	231	

* Instrumental velocity ** Calculated velocity

RETARDATION TEST

DATE 26 July 1957
TARGET Vest, Armor, M1953
RIFLE U.S., Caliber .30, M1903, Serial No. 1515142 with Caliber .30 Accuracy Test Barrel
CARTRIDGE Caliber .30 Loaded with 2nd Duplex Bullet and Western Ball-Type Propellant, Lot AL-2796-45, with full and reduced charges.

AMMUNITION TEMPERATURE 70°F. RANGE TEMPERATURE 82 to 83 °F. DENSITY .980 to .982

DISTANCE BETWEEN MUZZLE AND TARGET(ft) 55
DISTANCE FROM MUZZLE TO INITIATORS(ft) S_1 = 20, S_2 = 50, S_3 = 58, S_4 = 68 S_5 = 78

		VELOCITY (feet per second)						
ROUND NO.	TIME	AT 35 ft*	AT 25 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	RETARDATION	REMARKS
				22.5 GRAINS PROPELLANT				
227	1251	2392	2359	2304	2278	2325	34	
228	1252	2379	2346	2288	2262	2309	37	
229	1254	2379	2346	2288	2268	2304	42	
230	1256	2358	2325	2273	2247	2294	31	
231	1259	2355	2322	2262	2242	2278	44	
Average		2373	2340	2283	2259	2302	38	
				14.5 GRAINS PROPELLANT				
232	1303	1675	1659	1582	1567	1594	55	
233	1304	1753	1726	1661	1642	1676	50	
234	1305	1729	1703	1637	1618	1652	51	
235	1306	1717	1691	1629	1613	1642	49	
236	1308	1709	1683	1608	1595	1618	65	
Average		1717	1690	1623	1607	1636	54	
				9.5 GRAINS PROPELLANT				
238	1327	1182	1167	1073	1064	1080	87	Velocity not recorded on rds 237, 239, 243, 244, 245 and 246.
240	1332	1182	1167	1080	1074	1085	82	
241	1334	1219	1203	1119	1109	1127	76	
242	1413	1127	1114	1025	1018	1031	83	
247	1512	1157	1143	1046	1042	1049	94	
Average		1173	1159	1069	1061	1074	84	
				7.0 GRAINS PROPELLANT				
249	1522	1022	1014	926	923	928	86	Velocity not recorded on rds 248 and 250.
252	1529	1065	1055	969	962	975	80	
253	1545	1010	1002	903	899	906	96	
254	1547	1014	1006	932	926	937	69	Round 251 hit a previous shot hole.
255	1549	1065	1055	963	956	969	86	
Average		1035	1026	939	933	943	83	

* Instrumental velocity ** Calculated velocity

RETARDATION TEST

DATE 26 July 1957
TARGET Vest, Armor, M1953
RIFLE Code E, M70, Serial No 367044 with Caliber .25 Test Barrel
CARTRIDGE Ball, Caliber .25 with 75-Grain Bullet, Lot 74MC31 with reduced charge.

AMMUNITION TEMPERATURE 70°F RANGE TEMPERATURE 74 to 75°F. DENSITY 1.007 to .996

DISTANCE FROM MUZZLE TO TARGET(ft) 55
DISTANCE FROM MUZZLE TO INITIATORS(ft) S_1 = 20, S_2 = 30, S_3 = 58, S_4 = 68, S_5 = 78

		VELOCITY (feet per second)						
ROUND NO.	TIME	AT 15 ft*	AT 55 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	RETARDATION	REMARKS
			30.5 GRAINS PROPELLANT					
57	0848	2305	2362	2325	2309	2340	22	Bullets keyholed after perforating armor vest.
58	0852	2168	2146	2079	2053	2100	46	
59	0853	2232	2210	2155	2123	2181	29	
60	0855	2152	2130	2083	2066	2097	33	
61	0857	2283	2260	2208	2183	2228	32	
Average		2244	2222	2170	2147	2189	32	

* Instrumental velocity ** Calculated velocity

RETARDATION TEST

DATE 29 July 1957
TARGET Vest, Armor, M1953
RIFLE U.S., Caliber .30, M1903, Serial No. 1515142 with Caliber .30 Accuracy Test Barrel
CARTRIDGE Caliber .30, Loaded with 1st Triplex Bullet and Western Ball-Type Propellant, Lot AL-2796-45, with full and reduced charges.

AMMUNITION TEMPERATURE 70°F. RANGE TEMPERATURE 80 to 87°F. DENSITY .976 to .968

DISTANCE BETWEEN MUZZLE AND TARGET(ft) 55
DISTANCE BETWEEN MUZZLE TO INITIATORS(ft) S_1 = 20, S_2 = 50, S_3 = 58, S_4 = 68, S_5 = 78

		VELOCITY (feet per second)						
ROUND NO.	TIME	A* 35 ft*	AT 55 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	RETARDATION	REMARKS
			22.0 GRAINS PROPELLANT					
259	0943	2558	2500	2415	2387	2477	63	Velocity not recorded on rd 260.
261	0954	2720	2660	2564	2538	2585	75	
262	0955	2562	2504	2427	2398	2450	54	
263	0957	2708	2648	2564	2532	2590	58	
264	1022	2747	2687	2591	2558	2617	70	
Average		2659	2600	2512	2483	2536	64	
			11.0 GRAINS PROPELLANT					
265	1030	1486	1555	1445	1422	1463	81	
266	1032	1569	1527	1431	1410	1448	79	
267	1034	1585	1543	1443	1416	1465	78	
268	1036	1576	1534	1433	1412	1450	84	
269	1038	1589	1547	1445	1425	1461	86	
Average		1581	1539	1439	1417	1457	82	
			6.0 GRAINS PROPELLANT					
272	1047	1042	1027	892	864	898	129	Velocity not recorded on rds 270, 271 and 274. Rounds 273, 275, 278 hit previous shot holes.
276	1137	1165	1142	1017	1009	1023	119	
277	1139	1216	1189	1109	1099	1117	72	
279	1144	1227	1200	1114	1098	1127	73	
280	1146	1169	1146	989	980	996	150	
Average		1164	1141	1024	1014	1032	109	
			4.5 GRAINS PROPELLANT					
282	1240	931	891	769	763	774	117	Velocity not recorded on rds 281, 283, 284, 285, 287 and 290.
286	1307	917	907	729	719	737	170	
288	1315	979	967	822	806	817	150	
289	1318	972	960	795	789	800	160	
291	1322	994	981	898	891	904	77	
Average		953	941	801	794	806	135	

* Instrumental velocity ** Calculated velocity

RETARDATION TEST

DATE 29 and 31 July 1947
TARGET Vest, Armor, M1953
RIFLE U.S., Caliber .30, M1903, Serial No. 1515142 with Caliber .30 Accuracy Test Barrel
CART IDGE Caliber .30, Loaded with 2nd Triplex Bullet and Western Ball-Type Propellant, Lot AL-2796-45, with full and reduced charges.

AMMUNITION TEMPERATURE 70°F. RANGE TEMPERATURE 80 to 88°F. DENSITY .965 to .962
DISTANCE BETWEEN MUZZLE AND TARGET(ft) 55
DISTANCE FROM MUZZLE TO INITIATORS(ft) S_1 = 20, S_2 = 50, S_3 = 58, S_4 = 68, S_5 = 78

		VELOCITY (feet per second)						
ROUND NO.	TIME	AT 35 ft*	AT 55 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	RETARDATION	REMARKS
			21.0 GRAINS PROPELLANT					
292	1355	2600	2535	2439	2398	2472	66	
293	1356	2586	2524	2389	2364	2409	115	
294	1357	2609	2547	2421	2375	2458	89	
295	1358	2586	2524	2404	2364	2436	88	
296	1400	2502	2441	2320	2273	2358	83	
Average		2577	2515	2395	2355	2427	88	
			10.0 GRAINS PROPELLANT					
299	1408	1433	1391	1245	1227	1259	132	Rounds 297 and 298 hit previous shot holes.
300	1410	1435	1393	1272	1252	1288	105	
301	1412	1417	1377	1247	1227	1265	112	Velocity not recorded on rds 302 and 304.
303	1435	1381	1340	1236	1227	1243	97	
305	1533	1647	1600	1466	1439	1488	112	
Average		1463	1420	1293	1274	1308	112	
			6.0 GRAINS PROPELLANT					
306	1537	1087	1059	880	876	883	186	Round 307 hit a previous shot hole
309	1544	1213	1184	1033	1025	1039	145	
310	1546	1200	1171	1027	1019	1033	138	Velocity not recorded on rds 308 and 311.
315	0914	1263	1230	1093	1080	1103	127	
316	0917	1199	1170	1024	1018	1029	141	
Average		1192	1165	1011	1004	1027	147	
			4.0 GRAINS PROPELLANT					
318	0929	885	876	670	665	674	202	Velocity not recorded on rds 317, 319 through 334.
330	1056	889	881	Lost	Lost			
331	1057	857	849	Lost	Lost			
332	1059	855	847	586	Lost			
334	1107	868	820	Lost	Lost			
Average		851	843					

* Instrumental velocity ** Calculated velocity

RETARDATION TEST

DATE 31 July 1957
TARGET Vest, Armor, M1953
RIFLE U.S., Caliber .30, M1903, Serial No. 1515142 with Caliber .30 Accuracy Test Barrel
CARTRIDGE Caliber .30, Loaded with 2nd Triplex Bullet and Western Ball-Type Propellant, Lot AL-2796-45, with full and reduced charges.

AMMUNITION TEMPERATURE 70°F. RANGE TEMPERATURE 82 to 85°F. DENSITY .953 to .946

DISTANCE BETWEEN MUZZLE AND TARGET(ft) 55
DISTANCE FROM MUZZLE TO INITIATORS(ft) S_1=20, S_2 = 50, S_3 = 58, S_4 = 68, S_5 = 78

		VELOCITY (feet per second)						
ROUND NO.	TIME	AT 35 ft*	AT 55 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	RETARDATION	REMARKS
			3.0 GRAINS PROPELLANT					
335	1318	--		--	--			Bullet did not leave the bore.
336	1320	189		--	--			Bullet hit the target frame.
337	1323	527	522	394	381	404	118	Bullet hit edge of vest.
338	1335	--		--	--			Bullet did not pass over 2nd initiator.
339	1338	392		--	--			Partial penetration of the vest.
340	1344	636		--	--			Partial penetration of the vest.
341	1347	443		--	--			Partial penetration of the vest.
Average								
			3.5 GRAINS PROPELLANT					
342	1413	782		--	--			Bullets from rds 342 and 346 struck the armor plate in front of the 4th initiator.
343	1417	806	799	539	530	546	253	
344	1420	747	740	699	687	709	31	
345	1443	588		--	--			Partial penetration of the vest.
346	1445	703		--	--			There is a possibility that round 344 hit a previous hole in vest.
Average		725						

* Instrumental velocity ** Calculated velocity

RETARDATION TEST

DATE 31 July 1957
TARGET Vest, Armor, M1953
RIFLE U.S., Caliber .30, M1903, Serial No. 1515142 with Caliber .30 Accuracy Test Barrel
CARTRIDGE Caliber .30, Loaded with 3rd Triplex Bullet and Western Ball-Type Propellant, Lot AL-2796-45, with full and reduced charges.

AMMUNITION TEMPERATURE 70°F RANGE TEMPERATURE 85 to 89°F. DENSITY .946 to .947
DISTANCE BETWEEN MUZZLE AND TARGET(ft) 55
DISTANCE FROM MUZZLE TO INITIATORS(ft) S_1 = 80, S_2 = 50, S_3 = 58, S_4 = 68, S_5 = 78

		VELOCITY (feet per second)						
ROUND NO.	TIME	AT 35 ft*	AT 55 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	RETARDATION	REMARKS
			20.0 GRAINS PROPELLANT					
347	1450	2488	2425	2320	2257	2370	55	
348	1455	2408	2346	2227	2193	2254	92	
349	1457	2502	2439	2315	2278	2345	94	
350	1500	2477	2414	2299	2262	2329	85	
351	1501	2573	2509	2375	2336	2406	103	
Average		2490	2427	2307	2265	2341	86	
			9.5 GRAINS PROPELLANT					
352	1504	1326	1269	1144	--			Velocity at 73' from the muzzle was not recorded on rounds 352 and 354.
353	1508	1221	1190	1030	1026	1033	157	
354	1509	1341	1303	1159	--			
355	1511	1379	1340	1196	1182	1207	133	
356	1512	1388	1349	1214	1206	1225	124	
Average		1331	1294	1149				
			5.5 GRAINS PROPELLANT					
357	1514	1084	1064	918	947	919	145	Velocity at 73' from the muzzle was not recorded on rounds 358 through 361.
358	1516	1126	1106	944	----			
359	1517	1114	1092	940	----			
360	1518	1113	1086	938	----			
361	1520	1117	1095	----	----			
Average		1110	1089					

* Instrumental velocity ** Calculated velocity

RE...GLATION TEST

DATE 9 September 1957
TARGET Vest, Armor, M1953
RIFLE U.S., Caliber .30, M1903, Serial No. 1515142 with Caliber .30 Accuracy Test Barrel
CARTRIDGE Caliber .30, Loaded with 1st Duplex Bullet and Western Ball-type Propellant, Lot AL-2796-45

AMMUNITION TEMPERATURE 70°F RANGE TEMPERATURE 70 to 71°F. DENSITY 1.005 to 1.003

DISTANCE BETWEEN MUZZLE AND TARGET(ft) 55
DISTANCE FROM MUZZLE TO INITIATORS(ft) S_1 = 20, S_2 = 50, S_3 = 58, S_4 = 59, S_5 = 76

ROUND NO.	TIME	VELOCITY (feet per second) AT 35 ft*	AT 55 ft**	AT 63 ft*	AT 73 ft*	AT 55 ft**	RETARDATION	REMARKS
				7.0 GRAINS PROPELLANT				
367	1344	1103	1083	992	986	997	86	Velocity not recorded on rounds 369, 370, 372, 373 and 375.
368	1348	1092	1072	1021	1019	1023	49	
371	1356	1034	1019	976	971	980	39	
374	1404	978	966	884	881	886	80	
375	1406	985	972	893	890	895	77	
Average		1038	1022	953	949	956	66	

* Instrumental velocity ** Calculated velocity

BALLISTIC FIRING REPORT
TIME OF FLIGHT - REMAINING VELOCITY

DATE FIRED: 20 May 1957

CALIBER .30
GCE NO. 1521616
CARTRIDGE TYPE AND LOT: Cartridge, Ball, Caliber .30, M2, Lot PA 4407
SCREEN DISTANCES FROM MUZZLE: First 27.51 ft, Second 79.35 ft, Third 1775 ft, Last 1825 ft
TEMPERATURE: 56.3°F REL. DENSITY 1.015 DIRECTION OF FIRE TOWARD 0°

TIME FIRED	RD NO.	TIME 1st-2d sec x10⁻⁵	VELOCITY 1st-2d fps	TIME 2d-Last sec x10⁻⁵	VELOCITY 2d-Last fps	TIME 1st-3rd sec	WIND VEL. fps	COS WIND VEC-TOR	RANGE COMP. WIND fps
1311	1	2087	2404	3834	1304	.96069	6	-.9	-5.4
	2	2054	2434	3818	1302	.96283	3	-.7	-2.1
	3	2084	2408	3752	1333	.95043	12	-.7	-8.4
	4	2115	2451	3795	1318	.96376	6	-.4	-2.4
	5	2075	2498	3777	1324	.95316	6	-.9	-5.4
	6	2115	2451	3843	1301	.96906	6	-1	-6.0
	7	2123	2442	3823	1309	.96708	6	-1	-6.0
	8	2091	2479	3833	1304	.95996	3	-1	-3.0
	*								
	10	2125	2440	3837	1303	.97252	3	-.5	-1.5
	11	2100	2469	3752	1333	.95432	12	-.2	-2.4
	12	2141	2421	3910	1279	.98314	6	-.9	-5.4
	13	2124	2441	3834	1304	.96984	6	-.5	-3.0
	14	2115	2451	3774	1325	.96049	6	-.9	-5.4
	15	2122	2444	3838	1303	.97381	0	-.8	0
	16	2126	2438	3833	1304	.97156	0	-.9	0
	*								
	18	2041	2540	3865	1294	.97652	0	-.9	0
	19	2090	2480	3798	1319	.95892	0	-.9	0
	20	2132	2432	3810	1312	.96937	6	-.6	-3.6
	21	2098	2471	3823	1308	.96328	3	-.7	-2.1
1326	22	2111	2456	3861	1295	.97087	3	-.8	-2.4
	Avg.	2103	2465	3810	1308	.96355			-3.2

* Rounds 9 and 17 were lost.

BALLISTIC FIRING REPORT
TIME OF FLIGHT - REMAINING VELOCITY

DATE FIRED: 20 May 1957

CALIBER .22 Carbine
GUN NO. 304164
BARREL ASSEMBLED 19 August 54
CARTRIDGE TYPE: Cartridge, Ball, Caliber .22 Carbine
SCREEN DISTANCES FROM MUZZLE: First 28.51 ft Second 80.35 ft Third 1775 ft Last 1825 ft
TEMPERATURE: 59.3°F REL. DENSITY 1.009 DIRECTION OF FIRE TOWARD 0°

TIME FIRED	RD NO.	TIME 1st-2d sec x10^{-5}	VELOCITY 1st-2d fps	TIME 3d-Last sec x10^{-5}	VELOCITY 3d-Last fps	TIME 1st-3rd sec	WIND VEL. fps	COS WIND VEC-TOR	RANGE COMP. WIND fps
1350	1	1804	2874	5725	873	1.22098	6	-.9	-5.4
	2	1877	2762	6063	825	1.27945	9	-.9	-8.1
	3	1807	2869	5851	855	1.23555	3	-.9	-2.7
	4	1786	2903	5814	860	1.22089	3	-.9	-2.7
	*								
	7	1776	2919	5712	875	1.21074	0	-.9	0
	8	1800	2880	5781	865	1.22439	0	-1	0
	9	1791	2894	5732	872	1.21545	3	-.9	-2.7
	10	1791	2894	5754	869	1.21598	6	-.8	-4.8
	11	1777	2917	5729	873	1.20708	3	-.3	-.9
	12	1795	2889	5859	853	1.22917	3	-.7	-2.1
	13	1763	2940	5677	881	1.20010	6	-.9	-5.4
	*								
	15	1818	2851	5789	864	1.23271	0	-.2	0
	*								
	17	1788	2899	5774	866	1.21773	0	-1	0
	18	1789	2898	5719	874	1.21392	0	-.7	0
	*								
	20	1793	2891	5747	870	1.21791	0	-1	0
	21	1781	2911	5782	865	1.21683	0	-1	0
	22	1788	2899	5768	867	1.22154	6	-.8	-4.8
	23	1832	2830	5874	851	1.24875	6	-1	-6.0
	24	1772	2926	5720	874	1.20238	0	-1	0
	*								
1415	26	1794	2890	5742	871	1.21772	3	-.9	-2.7
	Avg.	1796	2888	5781	865	1.22246			-2.4

* Rounds were lost.

BALLISTIC FIRING REPORT
TIME OF FLIGHT - REMAINING VELOCITY

DATE FIRED: 20 May 1957

CALIBER .22 Carbine
GUN NO. 304164
BARREL ASSEMBLED 19 August 54
CARTRIDGE TYPE: Cartridge, Ball, Caliber .22 Carbine
SCREEN DISTANCES FROM MUZZLE: First 28.51 ft Second 80.35 ft Third 1775 ft Last 1825 ft
TEMPERATURE: 59.3°F REL. DENSITY 1.009 DIRECTION OF FIRE TOWARD 0°

TIME FIRED	RD NO.	TIME 1st-2d sec x10^{-5}	VELOCITY 1st-2d fps	TIME 3d-Last sec x10^{-5}	VELOCITY 3d-Last fps	TIME 1st-3rd sec	WIND VEL. fps	COS WIND VEC-TOR	RANGE COMP. WIND fps
1350	1	1804	2874	5725	873	1.22098	6	-.9	-5.4
	2	1877	2762	6063	825	1.27945	9	-.9	-8.1
	3	1807	2869	5851	855	1.23555	3	-.9	-2.7
	4	1786	2903	5814	860	1.22089	3	-.9	-2.7
	*								
	7	1776	2919	5712	875	1.21074	0	-.9	0
	8	1800	2880	5781	865	1.22439	0	-1	0
	9	1791	2894	5732	872	1.21545	3	-.9	-2.7
	10	1791	2894	5754	869	1.21598	6	-.8	-4.8
	11	1777	2917	5729	873	1.20708	3	-.3	-.9
	12	1795	2888	5859	853	1.22917	3	-.7	-2.1
	13	1763	2940	5677	881	1.20010	6	-.9	-5.4
	*								
	15	1818	2851	5789	864	1.23271	0	-.2	0
	*								
	17	1788	2899	5774	866	1.21773	0	-1	0
	18	1789	2898	5719	874	1.21392	0	-.7	0
	*								
	20	1793	2891	5747	870	1.21791	0	-1	0
	21	1781	2911	5782	865	1.21683	0	-1	0
	22	1788	2899	5768	867	1.22154	6	-.8	-4.8
	23	1832	2830	5874	851	1.24875	6	-1	-6.0
	24	1772	2926	5720	874	1.20238	0	-1	0
	*								
1415	28	1794	2890	5742	871	1.21772	3	-.9	-2.7
	Avg.	1796	2888	5781	865	1.22246			-2.4

* Rounds were lost.

[redacted]

[redacted]

DATE FIRED: [redacted] May 1957

CALIBER .22 Carbine
GUN NO. 304164
BARREL ASSEMBLED 19 August 54
CARTRIDGE TYPE : Cartridge, Ball, Caliber .[redacted] Carbine
SCREEN DISTANCES FROM MUZZLE: First 28.38 ft Second 80.24 ft Third 1180 ft Last 1220 ft
TEMPERATURE: 53.4°F REL. DENSITY 1.033 DIRECTION OF FIRE TOWARD 0°

TIME FIRED	RD NO.	TIME 1st-2d sec x10^{5}	VELOCITY 1st-2d fps	TIME 2d-Last sec x10^{5}	VELOCITY 2d-Last fps	TIME 1st-3rd sec	WIND VEL. fps	COS WIND VEC-TOR	RANGE COMP. WIND fps
1140	1	1822	2846	3602	1110	.64589	3	-.9	-2.7
	2	1800	2881	3574	1119	.63966	0	-.1	0
	3	1808	2868	3613	1107	.64484	0	-.1	0
	4	1853	2799	3687	1085	.66202	0	-.9	0
	5	1791	2896	3555	1125	.63481	0	-.7	0
	6	1805	2873	3591	1114	.64106	3	-1	-3.0
	7	1797	2886	3537	1131	.63473	3	-.9	-2.7
	*								
	9	1825	2842	3629	1102	.65000	0	-.7	0
	10	1796	2888	3554	1125	.63575	0	-.9	0
	11	1776	2920	3506	1141	.62697	0	-.1	0
	12	1770	2930	3448	1160	.62069	6	-1	-6.0
	13	1858	2791	3674	1089	.66193	3	-.9	-2.7
	14	1815	2857	3580	1117	.64271	0	-.8	0
	15	1786	2904	3496	1144	.62813	3	-.6	-1.8
	16	1825	2842	3583	1116	.64398	3	-1	-3.0
	17	1846	2809	3654	1095	.65601	0	-1	0
	18	1808	2868	3581	1117	.64104	0	-.9	0
	19	1791	2896	3483	1148	.62803	0	-.8	0
	20	1814	2859	3557	1125	.64099	3	-1	-3.0
1148	21	1789	2899	3551	1126	.63500	3	-1	-3.0
	Avg.	1809	2869	3573	1120	.64071			-1.4

* Round was lost.

BALLISTIC FIRING REPORT
TIME OF FLIGHT - REMAINING VELOCITY

DATE FIRED: 21 May 1957

CALIBER .22
GUN NO. 4747051
CARTRIDGE TYPE: Cartridge, Ball, Caliber .22, T48
SCREEN DISTANCES FROM MUZZLE: First 27.96 ft Second 79.94 ft Third 1180 ft Last 1220 ft
TEMPERATURE: 57.3°F REL. DENSITY 1.025 DIRECTION OF FIRE TOWARD 0°

TIME FIRED	RD NO.	TIME 1st-4th sec x10⁻⁵	VELOCITY 1st-4th fps	TIME 3d-last sec x10⁻⁵	VELOCITY 3d-last fps	TIME 1st-3rd sec	WIND VEL. fps	COS WIND VEC-TOR	RANGE COMP. WIND fps
1250	1	1613	3215	1766	2265	.42767	9	-.8	-7.2
	2	1600	3241	1759	2274	.42550	3	-1.	-3.0
	3	1615	3211	1782	2245	.43129	0	-1.	0
	4	1601	3239	1763	2269	.42726	0	-.8	0
	5	1710	3033	1781	2246	.43065	0	-.7	0
	6	1606	3229	1758	2275	.42636	0	-.7	0
	7	1591	3260	1761	2271	.42251	0	-1	0
	8	1594	3253	1736	2309	.42095	0	-.8	0
	9	1612	3217	1783	2243	.43186	0	-.8	0
	10	1605	3231	1767	2264	.42730	0	-.9	0
	*								
	15	1576	3291	1699	2354	.41409	0	/.5	0
	16	1588	3266	1710	2339	.41796	3	-.1	- .3
	17	1614	3213	1789	2236	.43422	3	-.1	- .3
	18	1586	3270	1722	2323	.41864	0	/.4	0
	19	1617	3207	1765	2241	.43280	0	/.4	0
	20	1583	3276	1728	2315	.41950	6	-1	-6.0
	21	1592	3258	1738	2301	.42152	0	-1	0
	22	1589	3264	1743	2295	.42228	3	-.8	-2.4
	23	1580	3282	1712	2336	.41822	3	.9	-2.7
1259	24	1583	3276	1724	2320	.42077	9	-.9	-8.1
	Avg.	1602	3237	1730	2306	.42457			-1.6

* Rounds 11 to 14 were lost.

BALLISTIC FIRING REPORT
TIME OF FLIGHT - RECORDING VELOCITY

DATE FIRED: 21 May 1957

CALIBER .30
GUN NO. 1521616
CARTRIDGE TYPE AND LOT: Cartridge, Ball, Caliber .30, M2, Lot FA 4407
SCREEN DISTANCES FROM MUZZLE: First 27.94 ft Second 79.80 ft Third 1180 ft Last 1220 ft
TEMPERATURE: 58.3°F REL. DENSITY 1.022 DIRECTION OF FIRE TOWARD 0°

TIME FIRED	RD NO.	TIME 1st-2d sec x10⁻⁵	VELOCITY 1st-2d fps	TIME 31-Last sec x10⁻⁵	VELOCITY 36-Last fps	TIME 1st-3rd sec	WIND VEL fps	COS WIND VEC-TOR	RANGE COMP. WIND fps
1330	1	2042	2540	2292	1745	.54585	3	- .3	- .9
	2	2083	2490	2393	1672	.56330	3	- .6	-1.8
	3	2101	2468	2412	1658	.56836	0	-1	0
	4	2084	2488	2388	1675	.56308	3	+ .3	+ .9
	5	2101	2468	2389	1674	.56587	3	- .6	-1.8
	6	2130	2435	2433	1644	.57429	9	-1	-9.0
	*								
	8	2107	2461	2401	1666	.56755	6	- .8	-4.8
	9	2090	2481	2370	1688	.56203	3	- .9	-2.7
	10	1930	2619	2237	1788	.53121	12	- .7	-8.4
	11	2125	2440	2423	1651	.57330	9	-1	-9.0
	12	2100	2470	2410	1660	.56793	0	-1	0
	13	2097	2473	2411	1659	.56717	3	-1	-3.0
	14	2163	2398	2487	1608	.58549	12	- .8	-9.6
	15	2105	2464	2414	1657	.56884	9	- .7	-6.3
	16	2131	2434	2436	1642	.57523	12	- .7	-8.4
	*								
	18	2116	2451	2412	1658	.57078	15	- .6	-9.0
	19	2088	2484	2361	1694	.56072	15	- .7	-10.5
	20	2117	2450	2426	1649	.57205	12	- .8	-9.6
	21	2124	2442	2437	1641	.57387	9	- .5	-4.5
1341	22	2097	2473	2376	1684	.56360	9	- .9	-8.1
	Avg.	2099	2471	2395	1671	.56603			-5.3

* Rounds 7 and 17 were lost.

BALLISTIC FIRING REPORT
TIME OF FLIGHT - REMAINING VELOCITY

DATE FIRED: 22 May 1957

CALIBER .30
JOB NO.: 1521616
CARTRIDGE TYPE AND LOT: Cartridge, Ball, Caliber .30, M2, Lot FA 4407
SCREEN DISTANCES FROM MUZZLE: First 27.40 ft Second 79.24 ft Third 580 ft Last 620 ft
TEMPERATURE: 57°F REL. DENSITY 1.028 DIRECTION OF FIRE TOWARD 0°

TIME FIRED	RD NO.	TIME 1st-4th sec x10⁻⁵	VELOCITY 1st-2d fps	TIME 3d-Last sec x10⁻⁵	VELOCITY 3d-Last fps	TIME 1st-3rd sec	WIND VEL. fps	COS WIND VEC-TOR	RANGE COMP WIND fps
1000	1	2081	2491	1985	2078	.24041	6	- .9	-5.4
	2	2141	2421	1979	2071	.24731	0	/ .5	0
	3	2089	2482	1931	2071	.24128	0	- .6	0
	4	2150	2411	2005	1995	.24925	0	/ .9	0
	5	2120	2445	1970	2030	.24533	3	/ .5	/1.5
	6	2103	2465	1952	2069	.24320	1	- .1	- .1
	7	2101	2467	1948	2053	.24291	0	- .9	0
	8	2071	2503	1921	2082	.23949	3	/ .8	/2.4
	9	2132	2409	1997	2003	.24888	4	/ .2	/ .8
	10	2136	2427	1985	2015	.24722	6	/ .6	/3.6
	*								
	16	2091	2479	1980	2080	.24159	8	/ .2	/1.6
	17	2102	2466	1942	2060	.24266	6	- .9	-5.4
	18	2113	2453	1963	2038	.24458	5	- .8	-4.0
	19	2121	2444	1973	2027	.24546	3	- .4	-1.2
	20	2147	2415	2005	1995	.24888	3	/ .3	/ .9
	21	2148	2413	2008	1992	.24902	3	/1.0	/3.0
	*								
	23	2076	2497	1922	2081	.23983	6	-1.0	-6.0
	24	2143	2419	1990	2010	.24767	3	-1.0	-3.0
	25	2171	2388	2032	1969	.25185	0	-1.0	0
1017	26	2075	2498	1921	2082	.23952	6	/ .6	/3.6
	Avg.	.02116	2450	.01967	2044	.24482			

* Rounds were lost.

BALLISTIC FIRING REPORT
TIME OF FLIGHT - REMAINING VELOCITY

DATE FIRED: 22 May 1957

CALIBER .22
GUN NO. 4747051
CARTRIDGE TYPE: Cartridge, Ball, Caliber .22, T48
SCREEN DISTANCES FROM MUZZLE: First 26.00 ft Second 79.84 ft Third 580 ft Last 620 ft
TEMPERATURE: 60.1°F VEL. DENSITY 1.021 DIRECTION OF FIRE TOWARD 0°

TIME FIRED	RD NO.	TIME 1st-2d S_1 sec x10^5	VELOCITY 1st-2d S_1 fps	TIME 3d-Last S_2 sec x10^5	VELOCITY 3d-Last S_2 fps	TIME 1st-Last sec	WIND VEL. fps	COS WIND VEC-TOR	RANGE COMP WIND fps
1044	1	1578	3285	1444	2770	.18203	0	-1.0	0
	2	1585	3271	1447	2764	.18177	0	- .9	0
	3	1592	3256	1461	2736	.18336	0	- .9	0
	4	1581	3279	1444	2770	.18148	0	- .6	0
	*								
	9	1578	3285	1443	2772	.18121	3	/ .4	/1.2
	*								
	12	1574	3294	1436	2786	.18036	6	- .3	-1.8
	*								
	15	1582	3277	1446	2766	.18154	6	- .9	-5.4
	*								
	18	1595	3250	1470	2721	.18421	12	-1.0	-12.0
	19	1585	3271	1453	2753	.18220	9	-1.0	-9.0
	20	1603	3234	1473	2716	.18466	3	-1.0	-3.0
	21	1585	3271	1473	2716	.18393	3	-1.0	-3.0
	22	1602	3236	1470	2721	.18432	0	- .9	0
	23	1605	3230	1474	2714	.18472	0	-1.0	0
	25	1580	3281	1447	2764	.18174	2	-1.0	-2.0
	26	1590	3260	1476	2710	.18467	0	- .8	0
	27	1585	3271	1449	2761	.18233	9	-1.0	-9.0
	28	1596	3248	1462	2736	.18366	6	- .9	-5.4
	30	1590	3260	1459	2742	.18350	0	-1.0	0
	31	1593	3254	1477	2705	.18504	12	- .8	-9.6
1136	2	1570	3302	1448	2762	.18175	9	- .7	-6.3
	Avg.	.01587	3266	.01458	2744	.18292			

* Rounds were lost.

BALLISTIC FIRING REPORT
TIME OF FLIGHT - MEASURING VELOCITY

DATE FIRED: 22 May 1957

CALIBER .22 Carbine
GUN NO. 304164
BARREL ASSEMBLED 19 August 54
CARTRIDGE TYPE: Cartridge, Ball, Caliber .22, Carbine
SCREEN DISTANCES FROM MUZZLE: First 23.40 ft Second 30.84 ft Third 580 ft Last 620 ft
TEMPERATURE: 62.1°F REL. HUMIDITY 1.014 DIRECTION OF FIRE TOWARD 0°

TIME FIRED	RD NO.	TIME 1st-2d sec x10⁻⁵	VELOCITY 1st-2d fps	TIME 3d-Last sec x10⁻⁵	VELOCITY 3d-Last fps	TIME 1st-Last sec	WIND VEL. fps	COS WIND VEC TOR	RANGE COMP WIND fps
1243	1	1825	2841	2130	1878	.43301	9	- .8	-7.2
	2	1756	2886	2068	1916	.22983	12	-1.0	-12.0
	3	1824	2842	2125	1887	.43354	6	-1.0	-6.0
	4	1805	2872	2097	1907	.23095	3	- .9	-2.7
	*								
	6	1834	2827	2131	1877	.23448	6	- .4	-2.4
	7	1797	2885	2084	1919	.22955	3	- .8	-2.4
	8	1824	2842	2126	1881	.23364	7	-1.0	-7.0
	9	1828	2836	2131	1877	.23434	6	-1.0	-6.0
	10	1807	2869	2092	1912	.23059	9	- .9	-8.1
	11	1812	2861	2109	1897	.23173	15	- .9	-13.5
	*								
	15	1773	2924	2049	1952	.22625	3	- .8	-2.4
	16	1792	2893	2074	1929	.22873	6	-1.0	-6.0
	*								
	20	1808	2867	2105	1900	.23127	0	-1.0	0
	21	1771	2927	2056	1946	.22647	0	- .8	0
	22	1765	2937	2034	1967	.22470	0	- .9	0
	*								
	24	1805	2878	2096	1908	.23060	10	- .4	-4.0
	25	1799	2888	2106	1899	.23070	0	- .4	0
	26	1775	2921	2061	1941	.22690	0	- .1	0
	27	1779	2914	2059	1943	.22708	6	- .2	-1.2
1315	28	1787	2901	2070	1932	.22820	3	- .9	-2.7
	Avg.	.01800	2880	.020909	1913	.23017			

* Rounds were lost.

BALLISTIC FIRING REPORT
TIME OF FLIGHT - REMAINING VELOCITY

DATE FIRED: 16 July 1957

CALIBER: .30
FIN NO: 1015142
BARREL NO. 1, Serial No. 64
CARTRIDGE TYPE AND LOT: Cartridge, Ball, Caliber .30, M2, Lot FA 4332 (Control)
SCREEN DISTANCES FROM MUZZLE: First 96.93 ft Second 78.52 ft Third 1.85 ft Last 1215 ft
TEMPERATURE: 76 to 79°F REL. DENSITY 0.986 to 0.979
DIRECTION OF FIRE TOWARD 0°

TIME FIRED	RD NO.	TIME 1st-2d $\times 10^{-5}$ sec	VELOCITY 1st-2d fps	TIME 3d-Last $\times 10^{-5}$ sec	VELOCITY 3d-Last fps	TIME 1st-3rd sec	WIND VEL. fps	COS WIND VEC TOR	RANGE COMP WIND fps
1413	173	1934	2668	1619	1853	.51607	8	- .4	-3.2
1414	174	1928	2676	1624	1847	.51559	3	- .2	- .6
1415	175	1940	2659	1625	1846	.51766	6	-1.	-6.0
1417	177	1940	2659	1624	1847	.51775	6	- .5	-3.0
1420	180	1940	2659	1767	1698	.51716	3		
1421	181	1950	2646	1632	1838	.52052	0		
1422	182	1946	2651	1636	1834	.51986	0		
1423	183	1926	2679	1609	1865	.51305	0		
1429	187	1918	2690	1602	1873	.51151	0		
1430	188	1918	2690	1595	1881	.51063	3	+ .3	+1.5
1431	189	1930	2673	1610	1863	.51481	0		
1432	190	1920	2687	1600	1875	.51192	3	+ .5	+1.5
1433	191	1918	2690	1607	1867	.51339	0		
1434	192	1938	2662	1625	1846	.51770	0		
1435	193	1922	2684	1603	1871	.51265	8	-1.	-8.0
1436	194	1936	2665	1623	1848	.51754	3	+ .5	+1.5
1437	195	1903	2711	1590	1887	.50805	0		
1438	196	1934	2668	1622	1850	.51671	3	+ .2	+ .6
1439	197	1936	2665	1621	1851	.51730	0		
1440	198	1950	2646	1626	1845	.51985	3	+ .9	+2.7

BALLISTIC FIRING REPORT
TIME OF FLIGHT - REMAINING VELOCITY

DATE FIRED: 16 July 1957

CALIBER .30
GUN NO. 1515142
BARREL NO. [illegible], Serial No. 64
CARTRIDGE TYPE AND LOT: Cartridge, Ball, Caliber .30, M2, Lot FA 4332 (Control)
SCREEN DISTANCES FROM MUZZLE: First 26.93 ft Second 78.52 ft Third 1790.00 ft Last 1810.00 ft
TEMPERATURE: 74.0°F REL. DENSITY 0.990 DIRECTION OF FIRE TOWARD 0°

TIME FIRED	RD NO.	TIME 1st-2d sec x10	VELOCITY 1st-2d fps	TIME 3d-Last sec x10	VELOCITY 3d-Last fps	TIME 1st-3rd sec	WIND VEL fps	COS WIND VEC-TOR	RANGE COMP. WIND fps
1040	148	1934	2668	1337	1496	.87740	10	↓ .9	↓9.0
1042	150	1952	2643	1365	1465	.89156	3	↓ .6	↓1.8
1043	151	1894	2724	1357	1474	.87657	3	↓1.	↓3.0
1044	152	1928	2676	1324	1511	.87408	3	↓ .5	↓1.5
1045	153	1953	2642	1366	1464	.89425	3	↓ .8	↓2.4
1046	154	1943	2655	1343	1489	.88485	8	↓ .9	↓7.2
1047	155	1904	2710	1309	1528	.86304	6	-1.	-6.0
1048	156	1936	2672	1345	1485	.88294	10	- .6	-6.0
1049	157	1937	2663	1350	1481	.88376	3	↓ .1	↓ .3
1051	159	1952	2643	1363	1467	.89082	6	↓1.	↓6.0
1052	160	1940	2659	1342	1490	.88222	3	↓1.	↓3.0
1053	161	1923	2683	1330	1504	.87394	5	↓ .5	↓2.5
1054	162	1950	2646	1358	1477	.89015	0		
1055	163	1947	2650	1360	1471	.88874	0		
1056	164	1966	2624	1368	1462	.89672	0		
1057	165	1915	2694	1320	1515	.87022	0		
1058	166	1939	2661	1352	1479	.88470	3	- .8	-2.4
1059	167	1950	2646	1355	1476	.88907	6	↓ .5	↓3.0
1100	168	1951	2644	1357	1474	.88913	3	↓ .3	↓ .9
1101	169	1923	2683	1325	1509	.87329	0		

BALLISTIC FIRING REPORT
TIME OF FLIGHT - REMAINING VELOCITY

DATE FIRED: 16 July 1957

CALIBER .22
GUN NO. 364827
BARREL ASSEMBLED 29 December 55
CARTRIDGE TYPE AND LOT: Cartridge, Caliber .22, Loaded with 50-Grain Full Patch Front Bullets for Caliber .22-06 Duplex Cartridge and 37.0 Grains of IMR No. 4895 Propellant, Lot ALA 2423
SCREEN DISTANCES FROM MUZZLE: First 27.00 ft Second 78.59 ft Third 1790.00 ft Last 1810.00 ft
TEMPERATURE: 74.0 to 76.0°F REL. DENSITY 0.990 to 0.986
DIRECTION OF FIRE TOWARD 0°

TIME FIRED	RD NO.	TIME 1st-2d sec x10^{-5}	VELOCITY 1st-2d fps	TIME 3d-Last sec x10^{-5}	VELOCITY 3d-Last fps	TIME 1st-3rd sec	WIND VEL. fps	COS WIND VEC-TOR	RANGE COMP. WIND fps
1124	147	1506	3426	1673	1195	.86665	0		
1128	148	1487	3469	1620	1235	.84562	0		
1130	150	1503	3432	1679	1191	.86784	3	+ .6	+1.8
1132	152	1504	3430	1656	1208	.85948	3	- .2	- .6
1133	153	1528	3376	1712	1168	.88486	0		
1148	161	1470	3510	1621	1233	.84131	0		
1149	162	1468	3514	1606	1245	.83588	3	+1.	+3.0
1150	163	1454	3548	1671	1197	.85374	0		
1151	164	1466	3519	1620	1235	.84005	0		
1152	165	1474	3500	1599	1251	.83511	0		
1153	166	1440	3583	1576	1269	.81922	0		
1154	167	1458	3538	1608	1244	.83451	6	- .9	-5.4
1155	168	1482	3481	1652	1211	.85270	0		
1156	169	1482	3481	1620	1235	.84496	6	- .9	-5.4
1158	171	1488	3467	1676	1193	.85988	3	-1.	-3.0
1201	173	1460	3534	1585	1262	.82709	0		
1211	179	1480	3486	1647	1214	.85262	3	+ .2	+ .6
1213	181	1472	3505	1595	1254	.83355	3	+ .2	+ .6
1214	182	1482	3481	1660	1205	.85828	0		
1215	183	1494	3453	1635	1223	.85004	0		

BALLISTIC FIRING REPORT
TIME OF FLIGHT - REMAINING VELOCITY

DATE FIRED: 16 - 17 July 1957

CALIBER .22
GUN NO. 364827
BARREL ASSEMBLED 29 DECEMBER 55
CARTRIDGE TYPE AND LOT: Cartridge, Caliber .22, Loaded with 50-Grain Full Patch Front Bullets for Caliber .22-06 Duplex Cartridge and 37.0 Grains of IMR 4895 Propellant, Lot ALA 5423

SCREEN DISTANCES FROM MUZZLE: First 27.00 ft Second 78.59 ft Third 1185.00 ft Last 1215.00 ft

TEMPERATURE: 79.0 to 80°F REL. DENSITY: 0.971
DIRECTION OF FIRE TOWARD 0°

TIME FIRED	RD NO.	TIME 1st-2d sec x10⁻⁵	VELOCITY 1st-2d fps	TIME 3d-Last sec x10⁻⁵	VELOCITY 3d-Last fps	TIME 1st-3rd sec	WIND VEL. fps	COS WIND VEC-TOR	RANGE COMP. WIND fps
1516	192	1500	3439	1686	1845	.45880	0		
1517	193	1488	3467	1609	1865	.44111	0		
1534	197	1500	3439	1618	1854	.45260	3	- .9	-2.7
1535	198	1496	3449	1646	1823	.45600	0		
1537	200	1488	3467	1618	1857	.45057	6	- .5	-3.0
1541	203	1464	3524	1573	1907	.44095	3	- .4	-1.2
1542	204	1492	3458	1607	1867	.44970	0		
1544	206	1494	3453	1645	1824	.45537	3	- .9	-2.7
1546	208	1448	3563	1578	1901	.43952	10	- .9	-9.0
1551	212	1484	3476	1599	1876	.44682	8	-1.	-8.0
1552	213	1484	3476	1626	1845	.45065	3	- .9	-2.7
1553	214	1458	3538	1577	1902	.44071	6	- .9	-5.4
1108	228	1510	3417	1651	1817	.45610	0		
1104	230	1506	3426	1655	1813	.45873	0		
1106	232	1510	3417	1663	1804	.46061	9	- .2	-1.8
1107	233	1495	3451	1634	1836	.45388	3	- .8	-2.4
1109	235	1514	3408	1680	1786	.46359	5	- .2	-1.0

BALLISTIC FIRING REPORT
TIME OF FLIGHT - REMAINING VELOCITY

CALIBER .30 DATE FIRED: 18 July 1957
GUN NO. 1515142
BARREL NO. 1, Serial No. 64
CARTRIDGE TYPE AND LOT: Cartridge, Ball, Caliber .30, M2, Lot FA 4332 (Control)
SCREEN DISTANCES FROM MUZZLE: First 26.93 ft, Second 78.52 ft, Third 580.00 ft, Last 620.00 ft
TEMPERATURE: 73.3 to 77.4°F REL. DENSITY 0.992 to 0.983
DIRECTION OF FIRE TOWARD 0°

TIME FIRED	ROUND NUMBER	TIME 1st-2d sec x10^{5}	VELOCITY 1st-2d fps	TIME 3d-Last sec x10^{5}	VELOCITY 3d-Last fps	TIME 1st-3rd sec	WIND VEL. fps
0928	203	1918	2690	1756	2278	.22156	0
0929	204	1954	2640	1796	2227	.22599	0
0930	205	1938	2662	1780	2247	.22409	0
0931	206	1946	2651	1790	2235	.22522	0
0932	207	1940	2659	1775	2254	.22347	0
0933	208	1936	2665	1776	2252	.22368	0
0934	209	1948	2648	1782	2245	.22476	0
0935	210	1960	2632	1799	2223	.22624	0
0936	211	1946	2651	1783	2243	.22482	0
0937	212	1952	2643	1794	2230	.22576	0
0938	213	1962	2629	1802	2220	.22685	0
0939	214	1938	2662	1774	2255	.22375	0
0940	215	1950	2646	1787	2238	.22525	0
0941	216	1974	2613	1808	2212	.22799	0
0942	217	1942	2657	1776	2252	.22409	0
0943	218	1942	2657	1776	2252	.22409	0
0944	219	1942	2657	1780	2247	.22442	0
0945	220	1946	2651	1781	2246	.22461	0
0946	221	1944	2654	1790	2247	.22447	0

BALLISTIC FIRING REPORT
TIME OF FLIGHT - MUZZLE VELOCITY

DATE FIRED: 18 July 1957

CALIBER: .22
GUN NO. 364827
BARREL ASSEMBLED: 29 December 55
CARTRIDGE TYPE AND LOT: Cartridge, Caliber .22, Loaded with 50-Grain Full Patch Front Bullets for Caliber .22-06 Duplex Cartridge and 37.0 Grains of IMR No. 4895 Propellant, Lot ALA 2423
SCREEN DISTANCES FROM MUZZLE: First 27.00 ft Second 78.59 ft Third 580.00 ft Last 620.00 ft
TEMPERATURE: 77.4 to 79.7°F REL. DENSITY 0.963 to 0.979
DIRECTION OF FIRE TOWARD 0°

TIME FIRED	RD NO.	TIME 1st-2d sec x10⁵	VELOCITY 1st-2d fps	TIME 2d-Last sec x10	VELOCITY 2d-Last fps	TIME 1st-Last sec	WIND VEL. mph	COS WIND VEC-TOR	RANGE COMP. WIND fps
1040	246	1504	3430	1548	2584	.18305	0		
1041	247	1504	3430	1538	2601	.18252	0		
1042	249	1494	3453	1532	2611	.18160	0		
1044	250	1486	3472	1524	2625	.18075	0		
1045	251	1516	3403	1558	2567	.18454	0		
1026	252	1506	3425	1550	2581	.18388	0		
1027	253	1492	3458	1532	2628	.18092	3	/.9	/2.7
1034	254	1498	3444	1526	2621	.18147	0		
1035	255	1500	3439	1526	2621	.18160	3	/.9	/2.7
1036	256	1520	3394	1561	2562	.18490	0		
1037	257	1494	3453	1525	2623	.18119	0		
1038	258	1504	3430	1539	2599	.18261	0		
1039	259	1502	3435	1538	2601	.18234	0		
1040	260	1514	3408	1568	2551	.18458	0		
1044	264	1490	3462	1524	2625	.18100	0		
1045	265	1522	3390	1549	2582	.18422	0		
1046	266	1522	3390	1549	2582	.18422	0		
1052	270	1498	3444	1536	2621	.18151	0		
1100	275	1478	3491	1510	2649	.17913	0		
1101	276	1492	3458	1529	2616	.18121	0		

MEAN METEOROLOGICAL CONDITIONS AT TIME OF FIRING

T = Temperature, °F
D = Relative Atmospheric Density
W_x = Range Component of Wind, fps

DATE	AMMUNITION	TIME	T	D	W_x
23 May	Duplex	1500-2100	64.7	1.006	9
23 May	Triplex	1700-2000	83.2	.962	12
	Duplex	2100-2115	79.5	.969	16
28 May	Triplex	1000-1400	63.4	1.015	8
	Duplex	1400-1500	68.3	1.003	7
12 June	Duplex	1800-2200	82.2	.972	3
17 June	Triplex	1800-2200	87.4	.962	-5
7 June	Duplex	1700-2200	78.0	.970	-6
10 June	Triplex	1600-2200	72.5	.998	-3

NOTE: Mean meteorological conditions for the single-projectile ammunition is given in the round-by-round data.

TIME OF FLIGHT TEST DATA

AMMUNITION: Cartridge, Ball, Caliber .30, Duplex (Loading Date: May 1956 Contract No. DA-19-079-507-CRD-2374)

SCREEN DISTANCES FROM MUZZLE: 10, 40, 290 and 310 ft for 100 yd data
10, 40, 890 and 910 ft for 300 yd data
10, 40, 60, 1495 and 1505 ft for 500 yd data

INSTRUMENTATION: Camera-Chronograph. (*Counter-Chronograph for 1st component for 25 ft Instrumental Velocity)

100 YARD DATA (Time of Flight: 10 to 290 ft Remaining Velocity at 300 ft)

DATE	ROUND NO.	INSTRUMENTAL VELOCITY AT 25 ft (COUNTER AND CAMERA) 1st Component *TIME sec	*VEL. fps	2nd Component TIME sec	VEL. fps	TIME OF FLIGHT Seconds 1st Comp.	2nd Comp	REMAINING VELOCITY (fps) 1st Component TIME sec	VEL. fps	2nd Component TIME sec	VEL. fps
22 May	7	.01219	2461	.01219	2461	---	---	.12442	.13350	.00997	2006	---	---
22 May	8	.01237	2425	.01336	2427	---	---	.12640	.13021	.01010	1980	.01054	1898
22 May	9	.01235	2429	.01234	2431	---	---	.12608	.12623	.01004	1992	---	---
22 May	10	.01214	2471	.01213	2473	---	---	.12667	.12893	.01043	1918	---	---
22 May	11	.01240	2419	.01237	2425	---	---	.12669	.12896	.01006	1984	.01015	1970
22 May	12	.01231	2437	.01230	2439	---	---	.12566	---	.01004	1992	---	---
22 May	13	.01214	2471	.01213	2473	---	---	.12410	---	.00993	2014	---	---
22 May	14	.01230	2439	.01230	2439	---	---	.12572	.12870	---	---	---	---
22 May	15	.01225	2449	.01226	2447	---	---	.12418	---	---	---	---	---
22 May	16	.01242	2415	.01238	2423	---	---	.12720	.12740	.01112	1799	.01122	1783
22 May	17	.01233	2433	.01233	2433	---	---	.12613	.12636	.01237	1617	.01419	1409
22 May	18	.01221	2457	.01220	2459	---	---	.12458	.13239	.00996	2008	.01063	1881
22 May	19	.01243	2414	.01242	2415	.01330	2257	---	---	---	---	---	---
22 May	20	.01228	2443	.01228	2443	.01313	2285	.12558	---	.00990	2020	---	---
22 May	21	.01256	2389	.01257	2387	---	---	.12830	.13259	---	---	---	---
22 May	22	.01236	2437	.01235	2429	---	---	.12616	.12670	.01014	1972	.01020	1961
22 May	23	.01194	2513	.01191	2519	.01222	2445	.12207	.12230	.00968	2066	.00984	2033
22 May	24	.01205	2490	.01202	2496	---	---	.12280	.12322	.00976	2049	.01020	1961
22 May	25	.01241	2417	.01244	2412	---	---	.12686	---	---	---	---	---
22 May	26	.01256	2389	.01250	2400	---	---	---	---	---	---	---	---
22 May	27	.01231	2437	.01232	2435	---	---	.12601	---	---	---	---	---
22 May	28	.01259	2381	.01259	2381	---	---	---	---	---	---	---	---
22 May	29	.01261	2342	.01260	2344	---	---	.13121	.13505	---	---	---	---
23 May	30	.01213	2473	.01212	2475	---	---	---	.13086	---	---	.01176	1754
23 May	31	.01189	2523	.01188	2525	---	---	.12196	.12870	.00990	2084	.01050	1964
23 May	32	.01248	2404	.01248	2404	---	---	.12720	.13210	.01050	1965	.01080	1910
28 May	1	.01214	2471	.01216	2467	.01326	2262	.13346	.13434	---	---	---	---
28 May	2	.01254	2392	.01256	2388	.01318	2276	.12866	---	.01030	1942	---	---
28 May	3	.01304	2301	.01304	2301	---	---	.13384	.13740	.01080	1852	.01104	1812
28 May	4	.01262	2377	.01264	2373	.01346	2229	.12970	.13594	---	---	.01092	1832
28 May	5	.01238	2423	.01240	2419	.01320	2273	.12698	.13284	.01010	1969	.01064	1880
28 May	6	.01224	2451	.01220	2459	.01334	2249	.12534	.13434	---	---	.01074	1862
28 May	7	.01225	2449	---	---	---	---	---	---	---	---	---	---
28 May	8	.01328	2259	.01326	2262	.01406	2134	---	---	---	---	---	---
28 May	9	.01234	2431	.01232	2435	.01288	2443	---	---	---	---	---	---
28 May	10	.01237	2425	.01238	2423	.01318	2276	---	.13332	---	---	.01066	1876
28 May	11	.01229	2441	.01232	2435	.01330	2256	---	---	---	---	---	---
28 May	12	.01214	2471	.01214	2471	.01306	2297	.12432	.13180	.01000	2000	---	---

ROUND NUMBER	TIME sec	1st Component VEL. fps	1st Component TIME sec	2nd Component VEL. fps	2nd Component TIME sec	2nd Component VEL. fps	TIME OF FLIGHT Seconds 1st Comp.	TIME OF FLIGHT Seconds 2nd Comp.	RELATIVE VELOCITY (fps) 1st Component TIME sec	RELATIVE VELOCITY (fps) 1st Component VEL. fps	RELATIVE VELOCITY (fps) 2nd Component TIME sec	RELATIVE VELOCITY (fps) 2nd Component VEL. fps
							300 YARD MARK (Time of Flight: 10 to 890 ft		Remaining Velocity at 900 ft)			
DATE: 7 June												
3	.01232	2436	.01216	2431	----	----	.50130	.50130	----	----	.1671	1168
4	.01289	2441	.01288	2443	----	----	------	.52734	----	----	------	------
5	.01196	2504	.01200	2500	----	----	------	------	----	----	------	------
6	.01294	2316	.01296	2315	----	----	------	------	----	----	------	------
7	.01284	2451	.01284	2451	----	----	------	------	----	----	------	------
8	.01191	2519	.01190	2521	----	----	------	------	----	----	------	------
9	.01203	2494	.01204	2492	.01298	2311	.46710	------	----	----	------	------
10	.01260	2381	.01258	2385	.01318	2276	.51108	.53156	.01604	1247	------	------
11	.01240	2419	.01242	2415	.01306	2268	.50780	.53544	.01598	1252	------	------
12	.01205	2490	.01206	2488	.01288	2463	.49114	.51653	.01574	1271	.01686	1189
13	.01241	2417	.01240	2419	.01320	2273	.50488	------	.01596	1253	------	------
14	.01197	2506	.01200	2500	.01296	2315	------	.51960	----	----	------	------
15	.01230	2423	.01240	2419	.01300	2306	.50644	------	.01600	1250	------	------
16	.01221	2457	.01220	2459	.01308	2294	.49656	------	.01576	1269	------	------
17	.01208	2488	.01206	2483	.01288	2259	.49084	.53044	----	----	------	------
18	.01289	2441	.01286	2447	.01288	2252	------	.51468	----	----	------	------
19	.01204	2492	.01202	2496	.01310	2290	------	------	----	----	------	------
20	.01214	2471	.01212	2475	.01298	2311	.49506	------	----	----	------	------
21	.01249	2402	.01248	2404	----	----	.51048	------	.01616	1236	------	------
22	.01231	2437	.01233	2433	.01316	2280	.50164	.53188	----	----	------	------
23	.01220	2459	.01218	2463	.01280	2273	.49570	------	.01570	1274	------	------
24	.01212	2475	.01210	2479	.01310	2290	.49170	------	.01574	1295	------	------
25	.01210	2479	.01210	2479	----	----	.49172	------	.01554	1287	------	------
26	.01205	2490	.01206	2483	.01312	2307	.49060	.52696	.01556	1305	------	------
27	.01246	2404	.01250	2400	.01322	2269	------	------	----	----	------	------
28	.01213	2473	.01212	2475	.01310	2290	.49310	------	----	----	------	------
29	.01190	2521	.01190	2521	.01296	2315	.48480	.52436	.01580	1316	------	------
30	.01234	2431	.01234	2431	.01294	2318	.50894	.52494	.01560	1282	------	------
31	.01264	2373	.01264	2373	----	----	.51420	------	.01648	1214	------	------
32	.01228	2443	.01228	2443	.01336	2246	------	.53698	----	----	------	------
33	.01201	2498	.01200	2500	.01300	2308	.49284	------	.01558	1284	------	------
34	.01284	2451	.01286	2447	.01284	2336	------	.52572	----	----	.01664	1202
35	.01284	2451	.01284	2451	.01310	2290	.49954	------	.01546	1294	------	------
36	.01199	2502	.01198	2504	----	----	.49188	------	.01554	1287	------	------
37	.01201	2498	.01204	2492	.01300	2308	.48986	.52200	----	----	.01652	1211
38	.01247	2406	.01246	2408	.01342	2235	.50490	------	.01580	1266	------	------
39	.01201	2498	.01200	2500	.01314	2283	.48984	------	.01536	1302	------	------
40	.01285	2449	.01286	2447	.01290	2326	.50250	------	.01598	1252	------	------
41	.01197	2506	.01198	2504	.01286	2370	------	.51366	----	----	------	------
42	.01280	2459	.01280	2459	.01284	2336	------	.52846	----	----	.01602	1203
43	.01244	2412	.01242	2415	.01294	2318	.51078	.53156	.01634	1242	------	------
44	.01198	2504	.01200	2500	.01290	2326	.48880	------	.01542	1297	------	------
45	.01218	2475	.01220	2479	.01306	2297	------	------	----	----	------	------
46	.01248	2404	.01248	2404	.01302	2304	------	.53226	----	----	.01670	1198
47	.01198	2517	.01194	2513	.01294	2318	.48636	.52340	.01532	1305	------	------
48	.01196	2508	.01196	2508	.01313	2276	.48694	.52840	.01538	1302	.01664	1202
49	.01227	2445	.01228	2443	.01304	2301	------	.52906	----	----	------	------
50	.01774	2535	.01176	2551	.01262	2340	.47742	.51264	.01506	1328	------	------

ROUND NUMBER	INSTRUMENTAL VELOCITY AT 85 % 1st Component TIME sec	1st Component VEL. fps	2nd Component TIME sec	2nd Component VEL. fps	TIME OF FLIGHT Seconds 1st Comp.	TIME OF FLIGHT Seconds 2nd Comp.	REMAINING VELOCITY (fps) 1st Component TIME sec	1st Component VEL. fps	2nd Component TIME sec	2nd Component VEL. fps
51	.01197	2506	.01200	2500	.01296	2315	.48646	-----	.01538	1305	-----	-----
52	.01184	2531	.01182	2535	-----	----	.50016	-----	-----	----	-----	----
53	.01181	2540	.01178	2547	.01246	2408	.48128	.51796	.01528	1309	.01644	1217
54	.01188	2525	.01186	2530	.01294	2336	.48572	.51676	-----	----	.01688	1232
55	.01189	2521	.01188	2523	.01336	2246	-----	.53880	-----	----	.01704	1174
56	.01209	2481	.01212	2475	.01292	2322	.49840	.52236	.01580	1266	-----	----
57	.01256	2396	.01254	2392	.01335	2246	.51576	-----	.01636	1222	-----	----
58	.01208	2488	.01204	2492	.01268	2366	.49240	.52488	-----	----	-----	----
59	.01254	2392	.01248	2382	.01354	2216	-----	.54424	-----	----	.01700	1176
60	.01189	2526	.01184	2534	.01270	2362	.48096	.51776	.01582	1314	-----	----
61	.01260	2419	.01258	2423	.01312	2287	-----	-----	-----	----	-----	----
62	.01191	2519	.01188	2525	.01306	2297	-----	.52680	-----	----	.01678	1192
63	.01185	2532	.01186	2530	.01304	2301	-----	.52346	-----	----	-----	----
64	.01201	2498	-----	----	-----	----	-----	-----	-----	----	-----	----
65	.01211	2477	.01208	2483	.01304	2301	.49308	.52766	.01568	1280	.01664	1208
66	.01219	2461	.01220	2459	.01320	2273	-----	-----	-----	----	-----	----
67	.01218	2463	.01218	2463	.01310	2290	-----	.53220	-----	----	-----	----
68	.01255	2394	.01254	2392	.01310	2290	-----	.53506	-----	----	.01694	1181
69	.01202	2496	.01198	2504	.01260	2381	.49386	.51734	.01562	1280	.01652	1285
70	.01184	2540	.01182	2538	.01296	2315	.48056	-----	-----	----	-----	----
71	.01172	2562	.01170	2564	.01270	2362	-----	-----	-----	----	-----	----
72	.01216	2467	.01216	2467	.01298	2311	.49650	.52540	.01570	1274	-----	----
73	.01210	2479	.01208	2483	.01302	2304	.49522	-----	.01564	1279	-----	----
74	.01209	2481	.01212	2475	.01302	2304	.49196	.53134	.01554	1287	-----	----

100 YARD DATA (Time of Flight: 10 to 1495 ft Remaining Velocity at 1500 ft)

#	DISTANCE, VELOCITY AT 25 ft: 1st Component TIME	1st Component VEL.	2nd Component TIME	2nd Component VEL.	DISTANCE, VELOCITY AT 10 ft: 1st Component TIME	1st Component VEL.	2nd Component TIME	2nd Component VEL.	TIME OF FLIGHT: Elevate 1st Comp.	Elevate 2nd Comp.	PENETRATION VELOCITY (fps): 1st Component TIME	1st Component VEL.	2nd Component TIME	2nd Component VEL.
	sec	fps	sec	fps	sec	fps	sec	fps	sec	sec	sec	fps	sec	fps
DATE: 12 June														
3	.01219	2475	.01210	2479	----	----	----	----	----	----	----	----	----	----
4	.01204	2492	----	----	----	----	----	----	----	----	----	----	----	----
5	.01170	2561	----	----	----	----	----	----	----	----	----	----	----	----
6	.01199	2502	----	----	----	----	----	----	----	----	----	----	----	----
7	.01219	2461	----	----	----	----	----	----	----	----	----	----	----	----
8	.01157	2590	.01198	2504	----	----	----	----	----	----	----	----	----	----
9	.01208	2481	.01208	2483	----	----	----	----	----	----	.91388	1.00810	.01014	986
10	.01208	2486	.01208	2486	----	----	----	----	----	----	1.04398	1.06400	.01028	973
11	.01211	2485	.01208	2486	.01298	2311	.01208	2473	.08564	1950	----	----	----	----
12	.01188	2538	.01182	2538	.01288	2329	.01984	2580	----	----	1.08570	1.09402	.01030	971
13	.01185	2538	.01182	2538	.01304	2297	.01982	2535	----	----	1.08678	----	.01014	986
14	.01198	2517	.01196	2506	.01304	2302	.02008	2498	----	----	.90486	1.03394	----	.01128
15	.01210	2479	.01210	2479	.01318	2257	.01136	2436	----	----	1.04392	1.09404	.01014	986
16	.01197	2506	.01198	2504	.01296	2315	----	----	.08882	2250	----	----	----	----
17	.01204	2492	.01216	2468	.01346	2408	.01080	2467	.08090	2398	----	----	----	----
18	.01178	2547	.01180	2542	.01232	2435	.01986	2580	.08060	2416	1.02104	----	.01016	984
19	.01181	2540	.01178	2538	.01228	2451	.01982	2518	.08000	2501	1.08346	----	.01012	988
20	.01236	2487	.01238	2483	.01234	2318	.01080	2434	----	----	----	1.07182	----	.01030
21	.01189	2533	.01190	2531	.01308	2308	.01998	2503	----	----	.03994	1.09106	.01016	984
22	.01200	2500	.01202	2497	.01246	2408	.01814	2483	----	----	1.03996	1.08006	.01012	988
23	.01170	2561	.01168	2565	.01298	2311	.01000	2500	----	----	1.03448	1.05980	.01016	984
24	.01207	2485	.01208	2483	----	----	.01060	2427	.08176	2298	----	----	----	----
25	.01209	2481	.01208	2481	.01308	2294	.01080	2465	----	----	----	----	----	----
26	.01201	2498	.01200	2500	----	----	----	----	----	----	1.04554	----	.01014	977
27	.01190	2521	.01192	2517	----	----	----	----	----	----	1.02990	1.06650	.01012	980
28	.01178	2547	.01178	2547	----	----	----	----	----	----	1.08854	1.07040	.01016	984
29	.01174	2555	.01174	2560	----	----	----	----	----	----	1.08030	1.09180	.01010	990
30	.01188	2525	.01188	2525	----	----	----	----	----	----	1.01354	----	.01026	975
31	.01203	2494	.01204	2492	----	----	----	----	----	----	1.04154	1.10764	.01024	977
32	.01193	2515	.01190	2521	.01296	2314	.01004	2495	----	----	1.03440	----	.01010	990
33	.01190	2521	.01188	2525	.01304	2301	.01998	2505	----	----	1.05120	----	.01018	982
34	.01198	2508	.01198	2504	.01320	2273	.01000	2498	----	----	----	1.10814	----	.01018
35	.01174	2555	.01174	2555	.01290	2311	----	----	----	----	1.00876	1.07046	.00996	1014
36	.01175	2553	.01178	2560	.01288	2309	----	----	----	----	1.01830	----	.00998	1012
37	.01189	2532	.01187	2527	.01304	2294	----	----	----	----	1.02304	1.06310	.00990	1004
38	.01201	2498	.01202	2497	.01286	2333	.01010	2478	.08152	2323	1.03278	----	.01000	1000
39	.01185	2532	.01186	2530	.01294	2315	.01016	2510	.08150	2386	1.02086	----	.00990	1010
40	.01188	2517	.01198	2517	.01286	2333	.01000	2500	.08136	2339	----	----	----	----
41	.01194	2512	.01190	2519	----	----	.01000	2418	.08146	2330	----	1.07366	----	.01000
42	.01210	2479	.01208	2483	.01304	2301	.01000	2500	.08200	2273	1.04186	----	----	----
43	.01179	2545	.01180	2542	.01316	2277	.01986	2518	.08184	2307	1.01944	1.09140	----	----
44	.01203	2494	.01206	2488	.01288	2318	.01016	2500	.08206	2264	1.03714	1.10538	.00996	1004
45	.01179	2545	.01180	2542	.01296	2314	.01978	2528	.08148	2328	1.08072	1.02990	.00994	1006
46	.01156	2595	.01158	2592	.01278	2347	.01990	2577	.08150	2336	----	----	----	----
47	.01179	2545	.01180	2542	.01288	2333	.01980	2524	.08136	2339	1.01542	1.07998	.00996	1004
48	.01187	2527	.01187	2525	.01280	2373	.01004	2499	.08154	2269	1.08990	----	.00998	1002
49	.01205	2490	.01204	2492	.01318	2276	.01018	2465	.08194	2279	1.04460	1.10570	.00998	1002
50	.01178	2547	.01180	2542	.01304	2327	.01998	2583	.08160	2315	1.01982	1.02944	.00986	1014
51	.01208	2485	.01210	2479	.01300	2320	.01000	2503	.08160	2315	1.03454	1.09408	.01002	998
52	.01213	2473	.01210	2479	.01288	2329	.01038	2403	.08142	2334	1.04798	1.09406	.01010	990

SUBJECT: Cartridge, Ball, Caliber .30, Brigham (Long Rock Chan. Lot No. 1956, 600 rds)

TYPE OF FIRING: 10, 50, 100 and 300 ft for 100 yd data
10, 50, 200 and 500 ft for 200 yd data
10, 50, 60, 1495 and 1505 ft for 300 yd data

INSTRUMENTATION: Chron-Chronograph (*Chronor-Chronograph used for checking 1st Component Velocity at 25 ft.)

TYPE OF DATA: (Time of Flight: 10 to 300 ft Remaining Velocity at 300 ft.)

No.	*Time	EXPERIMENTAL VELOCITY AT 25 FT. 1st Component Vel.		2nd Component Vel.		Vel.	Lot Comp.	TIME OF FLIGHT *Seconds 2nd Comp.	3rd Comp.	REMAINING VELOCITY (fps) 1st Component Time	Vel.	2nd Component Time	Vel.	3rd Component Time	Vel.
	sec	fps	sec	fps	fps				sec	fps	sec	fps	sec.	fps
DATE: 23 May														
1	.0160	2586	.0159	2588	----	----	.13548	-----	------	.01110	1802	------	----	------	----
2	.0160	2632	.0156	2636	----	----	.13859	.13310	------	.01037	1929	.01069	1878	------	----
3	.0158	2632	.0158	2632	----	----	.13859	.13698	------	.01004	1953	------	----	------	----
4	.0160	2586	.0160	2586	----	----	.13548	.13386	.13687	.01004	1992	.01033	1936	.01050	1887
5	.0160	2578	.0157	2578	----	----	.13487	------	------	.01052	1901	------	----	------	----
6	.0161	2569	.0161	2569	----	----	.13823	.13848	.13874	.01089	1944	.01040	1923	.01044	1916
7	.0155	2660	.0160	2657	----	----	.14088	.13990	.13783	.01053	1676	------	----	------	----
8	.0158	2579	.0155	2581	----	----	.13823	------	------	.01045	1970	------	----	------	----
9	.0154	2683	.0156	2659	.0157	2648	.13643	------	------	.01234	1620	------	----	------	----
10	.0170	2565	.0167	2571	.0167	2567	.13736	.13500	.14087	.01050	1624	.01083	1635	------	----
11	.0156	2661	.0156	2660	.0158	2645	.13818	.13040	.13974	.01089	1944	------	----	------	----
12	.0158	2606	.0160	2613	----	----	.13496	.13385	.13645	.01059	1869	------	----	------	----
13	.0155	2643	------	----	----	----	------	------	------	------	----	------	----	------	----
14	.0165	2575	.0164	2577	----	----	.13537	.13577	.13951	.01065	1878	.01278	1565	.01252	1589
15	.0153	2682	.0159	2669	.0158	2643	.13748	------	------	.01050	1987	------	----	------	----
16	.0159	2634	.0160	2640	----	----	.13558	.13894	------	.01108	1695	.01273	1690	------	----
DATE: 27 May															
1	------	----	------	----	----	----	------	------	------	------	----	------	----	------	----
2	.0154	2611	.0159	2609	.0158	2616	.13468	.13518	.13900	.01072	1886	.01216	1645	.01252	1605
3	.0158	2591	------	----	----	----	------	------	------	------	----	------	----	------	----
4	------	----	------	----	----	----	------	------	------	------	----	------	----	------	----
5	.0156	2624	.0158	2636	----	----	------	------	------	------	----	------	----	------	----
6	.0163	2596	.0158	2630	----	----	.13934	.14110	------	------	----	------	----	------	----
DATE: 28 May															
7	.0173	2516	.0172	2516	----	----	.13838	.13518	.13986	------	----	------	----	------	----
8	.0158	2634	.0160	2630	.0156	2628	.13736	.13558	.14060	.01060	1887	.01208	1664	.01278	1567
9	.0159	2586	.0160	2586	.0159	2608	.13548	.13562	.14398	.01088	1838	.01248	1606	.01316	1580
10	.0163	2588	.0160	2588	.0158	2581	.13548	.13868	.14398	.01136	1761	------	----	.01296	1543
11	.0159	2581	.0159	2617	.0159	2550	.13599	------	.14486	.01118	1789	------	----	.01336	1497
12	.0167	2578	.0168	2568	.0159	2630	.13736	.13780	.14486	.01090	1835	------	----	------	----
13	.0160	2580	.0160	2586	----	----	.13654	.13684	.14486	.01098	1820	------	----	.01316	1520
14	.0159	2600	.0158	2604	.0159	2630	.13736	.13974	.13989	.01080	1852	.01340	1774	.01278	1567
15	.0155	2510	.0158	2504	.0158	2544	.13736	------	.14364	------	----	------	----	.01258	1590
16	.0167	2571	.0164	2577	.0159	2600	.13736	.13684	.14264	.01096	1824	.01252	1597	.01330	1538
17	.0162	2538	.0158	2538	------	----	.13904	.14018	.14238	.01090	1833	------	----	------	----
18	.0163	2580	.0160	2586	.0158	2612	.13654	.13748	.14458	.01090	1833	.01254	1593	------	----
19	------	----	------	----	------	----	------	------	------	------	----	------	----	------	----
20	.0159	2609	.0160	2609	------	----	.13736	------	------	------	----	------	----	------	----

500 YARD DATA (Time of Flight: 10 to 1.95 ft Remaining Velocity at 1500 ft) Taken 17 June 1957

RD NO.	TIME sec	INSTRUMENTAL VELOCITY AT 25 ft 1st Component VEL. fps	TIME sec	VEL. fps	2nd Component TIME sec	VEL. fps	INSTRUMENTAL VELOCITY AT 35 ft 1st Component TIME	VEL. fps	2nd Component TIME sec	VEL. fps	TIME OF FLIGHT Seconds 1st Comp.	2nd Comp.	3rd Comp.	REMAINING VELOCITY (fps) 1st Component TIME sec	VEL. fps	2nd Component TIME sec	VEL. fps	3rd Component TIME sec	VEL. fps
53	.01133	2648	.01134	2646	.01220	2459	-----	----	-----	----	-----	-----	-----	-----	----	-----	----	-----	----
54	.01170	2564	.01168	2568	.01234	2431	-----	----	-----	----	1.32452	1.42442	-----	-----	----	.01498	668	-----	----
55	.01140	2632	.01140	2632	.01234	2431	.01920	2604	.02076	2408	-----	1.42474	-----	-----	----	.01410	703	-----	----
56	.01149	2611	.01148	2613	.01214	2471	.01934	2585	.02048	2441	-----	-----	-----	-----	----	-----	----	-----	----
57	.01119	2681	.01120	2679	.01208	2483	.01886	2651	.02026	2468	1.28186	1.42424	-----	.01332	750	-----	----	-----	----
58	.01137	2639	.01140	2632	.01204	2492	.01924	2599	.02030	2463	-----	1.42034	-----	-----	----	-----	----	-----	----
59	.01144	2622	.01146	2618	.01212	2475	.01932	2588	.02038	2453	1.20342	1.37964	-----	.01346	743	.01734	577	-----	----
60	.01133	2648	.01132	2650	.01232	2435	.01906	2623	.02068	2418	1.29406	-----	1.52136	.01650	606	-----	----	.01736	576
61	.01136	2641	.01136	2641	.01218	2463	.01916	2610	.02054	2434	-----	1.43532	-----	-----	----	-----	----	-----	----
62	.01128	2660	.01130	2655	.01200	2500	.01906	2623	.02024	2470	1.26770	1.40756	-----	.01304	767	.01416	706	-----	----
63	.01132	2650	.01130	2655	.01204	2492	.01912	2615	.02024	2470	-----	1.31526	-----	-----	----	-----	----	-----	----
64	.01130	2655	.01128	2660	.01218	2463	.01902	2629	.02041	2450	-----	-----	-----	-----	----	-----	----	-----	----
65	.01140	2632	.01140	2632	.01238	2423	.01922	2601	-----	----	1.27382	-----	-----	.01302	768	-----	----	-----	----
66	.01143	2625	.01140	2632	.01242	2415	.01928	2593	.02094	2388	1.29862	-----	-----	.01352	740	-----	----	-----	----
67	.01155	2597	.01154	2600	.01230	2439	.01956	2556	.02076	2408	-----	-----	-----	-----	----	-----	----	-----	----
68	.01117	2686	.01116	2688	.01222	2455	.01880	2660	.02036	2456	1.27844	1.41436	-----	.01272	786	.01640	610	-----	----
69	.01159	2588	.01158	2591	.01244	2412	.01986	2518	.02106	2374	-----	-----	-----	-----	----	-----	----	-----	----
70	.01157	2593	.01158	2591	.01242	2415	.01958	2554	.02088	2395	-----	-----	-----	-----	----	-----	----	-----	----
71	.01135	2643	.01136	2641	.01226	2447	.01948	2567	.02112	2356	-----	-----	-----	-----	----	-----	----	-----	----
72	.01139	2634	.01142	2627	.01212	2475	.01930	2591	.02046	2444	1.27904	-----	-----	.01312	762	-----	----	-----	----
73	.01152	2604	.01150	2609	.01220	2459	.01942	2575	.02094	2388	1.31384	-----	-----	.01344	744	-----	----	-----	----
74	.01136	2641	.01136	2641	.01240	2419	.01920	2604	.02080	2404	1.28986	-----	1.50566	-----	----	-----	----	.01550	645
75	.01137	2639	.01136	2641	.01218	2463	.01910	2618	.02110	2370	1.28326	-----	1.45004	.01370	730	-----	----	.01448	691
76	.01158	2591	.01158	2591	.01250	2400	.01956	2556	.02162	2313	1.32214	-----	-----	.01398	715	-----	----	-----	----
77	.01136	2641	.01138	2636	.01200	2500	.01914	2612	.02126	2352	1.30588	1.42080	-----	.01388	720	.01400	714	-----	----
78	.01155	2597	.01157	2593	.01236	2427	.01952	2561	.02076	2409	1.32040	-----	-----	.01402	713	-----	----	-----	----
79	.01130	2655	.01132	2650	.01200	2500	.01910	2618	.02034	2458	-----	-----	-----	-----	----	-----	----	-----	----
80	.01128	2660	.01128	2660	.01212	2475	.01906	2623	.02044	2446	1.21006	1.33918	1.36426	.01344	744	.01430	699	.01454	688
81	.01120	2679	.01120	2679	.01204	2492	.01890	2646	.02024	2470	1.27904	1.40418	-----	.01366	732	.01412	708	-----	----

VELOCITY TEST

Time Started: 1439 Time Completed: 1518 Date: 25 April 1957
Code E, M70, Serial No. 304164, Manufactured by Code G, 19 August 1954
Ammunition Temperature: 70°F. Range Temperature 63°F Density 1.021
Chronograph Type: Counter Initiator Type: Lumiline
Test Ammunition: Ball, Caliber .22, Carbine

ROUND NO.	INSTRUMENTAL VELOCITY AT 78 FEET IN FEET PER SECOND	ROUND NO.	INSTRUMENTAL VELOCITY AT 78 FEET IN FEET PER SECOND
1	2836	11	2825
2	2841	12	2864
3	2869	13	2899
4	2834	14	2877
5	2892	15	2864
6	2851	16	2872
7	2865	17	2890
8	2856	18	2860
9	2860	19	2859
10	2842	20	2879

Time Started: 1528 Time Completed: 1547 Date: 25 April 1957
Springfield, Caliber .22, Serial No.4747051 Manufactured by Code H,
4 September 1954
Ammunition Temperature: 70°F Range Temperature: 63°F Density 1.019
Chronograph Type: Counter Initiator Type: Lumiline
Test Ammunition: Ball, Caliber .22, T48

ROUND NO.	INSTRUMENTAL VELOCITY AT 78 FEET IN FEET PER SECOND	ROUND NO.	INSTRUMENTAL VELOCITY AT 78 FEET IN FEET PER SECOND
1	3264	11	3289
2	3249	12	3240
3	3303	13	3255
4	3303	14	3285
5	3285	15	3230
6	3247	16	3283
7	3230	17	3266
8	3238	18	3253
9	3232	19	3232
10	3296	20	3211

PRESSURE TEST

Time Started 1307 Time Completed: 1355 Date: 25 April 1957
Universal Receiver No. 127, Manufactured by Code G, 16 August 1954
Ammunition Temperature 70°F Range Temperature: 62°F Density 1.025
Chronograph Type: Counter Initiator Type: Lumiline
Test Ammunition: Ball, Caliber .22, Carbine

ROUND NUMBER	INSTRUMENTAL VELOCITY AT 78 FEET IN FEET PER SECOND	PRESSURE psi
1	2818	35,800
2	2826	37,300
3	2807	38,000
4	2756	33,600
5	2851	38,100
6	2839	39,500
7	2801	35,100
8	2743	32,600
9	2815	36,200
10	2825	36,000
11	2830	36,000
12	2815	36,400
13	2826	36,700
14	2838	37,600
15	2814	36,300
16	2862	38,200
17	2834	37,300
18	2838	38,700
19	2828	36,900
20	2839	37,500

PRESSURE TEST

Time Started: 1242 Time Completed: 1429 Date: 17 June 1957
Universal Receiver No. 197 Barrel No. 3830
Ammunition Temperature: 70°F Range Temperature: 87 to 91°F
Density 0.958 to 0.960
Chronograph Type: Counter Initiator Type: Lumiline
Test Ammunition: Ball, Caliber .30, Duplex Control Ammunition: Reference Rounds

ROUND NUMBER	INSTRUMENTAL VELOCITY AT 78 FEET IN FEET PER SECOND	PRESSURE psi
1	2491	53,600
2	2408	52,500
3	2428	52,100
4	2443	51,000
5	2431	52,300
6	2462	52,400
7	2478	52,800
8	2393	47,200
9	2443	52,600
10	2425	50,600
11	2428	54,300
12	2405	48,600
13	2469	52,300
14	2470	52,800
15	2474	55,800
16	2475	54,900
17	2455	53,200
18	2455	50,800
19	2428	49,700
20	2457	52,800

PRESSURE TEST

Time Started: 1445 Time Completed: 1608 Date: 17 June 1957
Universal Receiver No. 197 Barrel No. 3830
Ammunition Temperature: 70°F Range Temperature: 93°F Density 0.957
Chronograph Type: Counter Initiator Type: Lumiline
Test Ammunition: Ball, Caliber .30, Triplex Control Ammunition: Reference Rounds

RD NO.	INSTRUMENTAL VELOCITY AT 78 ft (fps)	PRESSURE psi	RD NO.	INSTRUMENTAL VELOCITY AT 78 ft (fps)	PRESSURE psi
1	2252	56,200	1	2640	44,000
2	2551	54,500	2	2591	40,900
3	2584	54,100	3	2599	41,600
4	2244	54,100	4	2606	42,300
5	2548	59,000	5	2621	44,300
6	2571	58,900	6	2618	43,600
7	2546	56,600	7	2587	42,500
8	2542	53,100	8	2612	44,200
9	2580	58,200	9	2616	43,000
10	2538	52,600	10	2618	44,000
11	2552	56,200	11	2627	46,500
12	2527	52,200	12	2592	44,900
13	2308	53,800	13	2597	44,700
14	2491	53,000	14	2592	43,700
15	2534	53,000	15	2585	42,800
16	2215	55,800	16	2597	44,300
17	2496	52,100	17	2601	43,100
18	2545	58,400	18	2583	41,700
19	2272	55,400	19	2580	42,700
20	2564	55,300	20	2585	42,400

VELOCITY TEST

Time Started: 1102 Time Completed 1134 Date: 21 June 1957
Rifle, U.S., M1903, Serial No. 1515148 with Caliber .30 Accuracy Test Barrel
Ammunition Temperature 70°F Range Temperature 76 to 79°F Density 0.980
Chronograph Type: Counter Initiator Type: Lumiline
Test Ammunition: Cartridge, Ball, Caliber .30 M2, Lot FA 4310 with full and reduced charges.

RD NO.	INSTRUMENTAL VELOCITY AT 55 ft (fps)	RD NO.	INSTRUMENTAL VELOCITY AT 55 ft (fps)
	FULL CHARGE		40.0 GRAINS PROPELLANT
4	2650	14	2269
5	2687	15	2198
6	2667	16	2281
7	2686	17	2242
8	2688	18	2283
Average	2664	Average	2255
	45.0 GRAINS PROPELLANT		30.0 GRAINS PROPELLANT
9	2387	19	1651
10	2432	20	1719
11	2360	21	1708
12	2447	22	1756
13	2398	23	1626
Average	2405	Average	1692

VELOCITY TEST

Time Started: 1307 Time Completed: 1328 Date: 21 June 1957
Rifle, Code E, M70, Serial No. 367844 with Caliber .25 Test Barrel
Ammunition Temperature: 70°F Range Temperature: 81 to 83°F
Density: 0.973 to 0.974
Chronograph Type: Counter Initiator Type: Lumiline
Cartridge, Ball, Caliber .25, with 75-Grain Bullet, Lot 74MC31 with full and reduced charges.

RD NO.	INSTRUMENTAL VELOCITY AT 55 ft (fps)
FULL CHARGE	
5	3458
6	3458
7	3467
9	3434
10	3441
Average	3452
41.0 GRAINS PROPELLANT	
11	3064
12	3119
13	3177
14	3049
15	3108
Average	3103

RD NO.	INSTRUMENTAL VELOCITY AT 55 ft (fps)
36.0 GRAINS PROPELLANT	
16	2644
17	2667
18	2567
19	2703
20	2682
Average	2653
26.0 GRAINS PROPELLANT	
21	2044
22	1944
23	1998
24	1989
25	1936
Average	1970

VELOCITY TEST

Time Started: 1517 Time Completed: 1534 Date: 21 June 1957
Rifle, U.S., M1903, Serial No. 1515142 with Caliber .30 Accuracy Test Barrel.
Ammunition Temperature: 70°F Range Temperature: 83 to 82°F Density 0.968
Chronograph Type: Counter Initiator Type: Lumiline
Cartridge, Ball, Caliber .30, M2, Lot FA 4310 with reduced charges.

ROUND NUMBER	INSTRUMENTAL VELOCITY AT 55 ft (fps)
43.0 GRAINS PROPELLANT	
27	2404
28	2426
29	2347
30	2309
31	2364
Average	2370
36.5 GRAINS PROPELLANT	
32	2103
33	2108
34	2081
35	2077
36	2092
Average	2092
29.5 GRAINS PROPELLANT	
37	1746
38	1728
39	1754
40	1705
41	1604
Average	1723

VELOCITY TEST

Time Started: 0945 Time Completed: 1107 Date 4 June 1957
Rifle, Code E, NTO, Serial No. 364827 with Caliber .22 Test Barrel
Ammunition Temperature: 70°F Range Temperature: 81 to 87°F
Density: 0.973 to 0.969
Chronograph Type: Counter Initiator Type: Lumiline
Cartridge, Ball, Caliber .22 with 50-Grain Bullet, Lot 10 LK4, with full and reduced charges.

RD NO.	INSTRUMENTAL VELOCITY AT 55 feet (fps)
FULL CHARGE (47.7 grs)	
10	3774
11	3788
12	3757
13	3802
14	3817
Average	3788
43.0 GRAINS PROPELLANT	
15	3236
16	3358
17	3333
18	3226
19	3333
Average	3297
38.0 GRAINS PROPELLANT	
20	2992
21	2953
22	2926
23	2894
24	2887
Average	2930

RD NO.	INSTRUMENTAL VELOCITY AT 55 feet (fps)
28.0 GRAINS PROPELLANT	
25	2480
26	2445
27	2349
28	2468
29	2285
Average	2405
18.0 GRAINS PROPELLANT	
30	1686
31	1673
32	1916
33	1599
34	1588
Average	1692

VELOCITY TEST

Time Started: 1333 Time Completed: 1353 Date: 24 June 1957
Rifle, Code H, M70, Serial No. 304164 with Caliber .22 Carbine Test Barrel
Ammunition Temperature: 70°F Range Temperature 88 to 90°F
Density 0.960 to 0.962
Chronograph Type: Counter Initiator Type: Lumiline
Cartridge, Ball, Caliber .22, Carbine, with full and reduced charges.

RD NO.	INSTRUMENTAL VELOCITY AT 55 ft (fps)	RD NO.	INSTRUMENTAL VELOCITY AT 55 ft (fps)
FULL CHARGE		**10.0 GRAINS PROPELLANT**	
310	2948	320	2180
311	2999	321	2175
312	2941	322	1947
313	2964	323	2185
314	2939	324	2089
Average	2958	Average	2089
13.0 GRAINS PROPELLANT		**7.0 GRAINS PROPELLANT**	
315	2424	325	1695
316	2485	326	1697
317	2437	327	1406
318	2364	328	1550
319	2294	329	1633
Average	2401	Average	1596

VELOCITY TEST

Time Started: 1445 Time Completed: 1504 Date: 24 June 1957
Rifle, Code E, M70, Serial # 367368 with Caliber .27 Test Barrel
Ammunition Temperature: 70°F Range Temperature: 90 to 91°F
Density: 0.962 to 0.955
Chronograph Type: counter Initiator Type: Lumiline
Cartridge, Ball, Caliber .27 with 95-Grain Bullet, Lot 66 IM62, with full and reduced charges.

RD NO.	INSTRUMENTAL VELOCITY AT 55 ft (fps)	RD NO.	INSTRUMENTAL VELOCITY AT 55 ft (fps)
	FULL CHARGE		35.0 GRAINS PROPELLANT
4	3102	14	2633
5	3117	15	2664
6	3145	16	2475
7	3125	17	2257
8	3155	18	2430
Average	3149	Average	2492
	40.0 GRAINS PROPELLANT		25.0 GRAINS PROPELLANT
9	2952	19	1597
10	2902	20	1881
11	2915	21	1788
12	2905	22	1766
13	2707	23	1729
Average	2876	Average	1752

VELOCITY TEST

Time Started: 1527 Time Completed: 1535 Date: 24 June 1957
Rifle, Winchester, M70, Serial No. 364827 with Caliber .22 Test Barrel
Ammunition Temperature: 70°F Range Temperature: 91 to 92°F
Density: 0.955 to 0.961
Chronograph Type: Counter Initiator Type: Lumiline
Cartridge, Ball, Caliber .22, T48 with full and reduced charges.

RD NO.	INSTRUMENTAL VELOCITY AT 55 ft (fps)
	FULL CHARGE (44.3 grs)
38	3177
39	3109
40	3183
41	3106
42	3111
Average	3138
	39.0 GRAINS PROPELLANT
43	2921
44	2830
45	2723
46	2834
47	Lost

VELOCITY TEST

Time Started: 0849 Time Completed: 1023 Date: 25 June 1957
Rifle, U.S., Caliber .30, M1903, Serial No. 4747051 with Caliber .22 Code H Barrel
Ammunition Temperature: 70°F Range Temperature: 79 to 83°F
Density: 0.971 to 0.967
Chronograph Type: Counter Initiator Type: Lumiline
Cartridge, Ball, Caliber .22, T48 with full and reduced charges.

RD NO.	INSTRUMENTAL VELOCITY AT 55 ft (fps)	RD NO.	INSTRUMENTAL VELOCITY AT 55 ft (fps)
	FULL CHARGE (44.3 grs)		34.0 GRAINS PROPELLANT
323	3305	333	2330
324	3287	334	2309
325	3311	335	2463
326	3268	336	2632
327	3292	337	2510
Average	3293	Average	2449
	39.0 GRAINS PROPELLANT		24.0 GRAINS PROPELLANT
328	2939	338	1742
329	2830	339	1687
330	2812	340	1759
331	2660	341	1547
332	2719	342	1695
Average	2792	Average	1686
			14.0 GRAINS PROPELLANT
		349	1036
		350	1115
		351	Lost
		353	580
		354	1288

VELOCITY TEST

Time Started: 1110 Time Completed: 1316 Date: 9 July 1957
Rifle, U.S., Caliber .30, M1903, Serial No. 1515142 with Caliber .30 Accuracy Test Barrel
Ammunition Temperature: 70°F Range Temperature: 81 to 85°F
Density: 0.957 to 0.949
Chronograph Type: Counter Initiator Type: Lumiline
Cartridge, Caliber .30, Loaded with 1st Duplex Bullet with Western Ball Type Propellant, Lot AL-2796-45

RD NO.	INSTRUMENTAL VELOCITY AT 55 ft (fps)	RD NO.	INSTRUMENTAL VELOCITY AT 55 ft (fps)
	25.0 GRAINS PROPELLANT		15.0 GRAINS PROPELLANT
70	2438	80	1774
71	2564	81	1802
72	2550	82	1785
73	2573	83	1783
74	2551	84	1786
Average	2526	Average	1786
	20.0 GRAINS PROPELLANT		10.0 GRAINS PROPELLANT
75	2202	85	1185
76	2165	86	1285
77	2222	87	1273
78	2237	88	1291
79	2192	89	1285
Average	2204	Average	1264

VELOCITY TEST

Time Started: 1333 Time Completed: 1437 Date: 9 July 1957
Rifle, U.S., Caliber .30, M1903, Serial No. 1515142 with Caliber .30 Accuracy Test Barrel
Ammunition Temperature: 70°F Range Temperature: 85 to 86°F
Density: 0.949
Chronograph Type: Counter Initiator Type: Lumiline
Cartridge, Caliber .30, Loaded with 1st Tripler Bullet with Western Ball Type Propellant, Lot AL 2796-45

RD NO.	INSTRUMENTAL VELOCITY AT 55 ft (fps)
	25.0 GRAINS PROPELLANT
90	2890
	22.0 GRAINS PROPELLANT
91	2697
92	2677
93	2674
94	2690
95	2697
Average	2687
	17.0 GRAINS PROPELLANT
96	2223
97	2238
98	2269
99	2254
100	2243
Average	2245

RD NO.	INSTRUMENTAL VELOCITY AT 55 ft (fps)
	12.0 GRAINS PROPELLANT
101	1668
102	1721
103	1709
104	1701
105	1745
Average	1709
	7.0 GRAINS PROPELLANT
106	1019
107	1066
108	1083
109	1087
110	1096
Average	1070

VELOCITY TEST

Time Started: 1430 Time Completed: 1521 Date: 10 July 1957
Rifle, Code K, M70, Serial No. 364827 with Caliber .22 Test Barrel
Ammunition Temperature: 70°F Range Temperature: 78°F Density: 0.983
Chronograph Type: Counter Initiator Type: Lumiline
Cartridge, Caliber .22, Loaded with 50-Grain Full Patch Front Bullets for Caliber .22-06 Duplex Cartridge*

RD NO.	INSTRUMENTAL VELOCITY AT 78 ft (fps)
	25.0 GRAINS PROPELLANT
88	2494
	30.0 GRAINS PROPELLANT
89	2701
	35.0 GRAINS PROPELLANT
90	3203
	37.0 GRAINS PROPELLANT
91	3344
	37.5 GRAINS PROPELLANT
92	3499
	37.0 GRAINS PROPELLANT
93	3333
94	3477
95	3392
96	3484
97	3322
Average	3402

* Propellant: DH No. 4895, Lot No. ALA. 2423

VELOCITY TEST

Time Started: 0955 Time Completed: 1022 Date: 11 July 1957
Rifle, Code E, M70, Serial No. 364827 with Caliber .22 Test Barrel
Ammunition Temperature: 70°F Range Temperature 76°F Density: 0.992
Chronograph Type: Counter Initiator Type: Lumiline
Cartridge, Caliber .22, Loaded with 50-Grain Full Patch Front Bullets for Caliber .22-06 Duplex Cartridge*

RD NO.	INSTRUMENTAL VELOCITY AT 78 ft (fps)
32.0 GRAINS PROPELLANT	
101	2917
102	2632
103	3117
104	3125
106	3163
Average	2991
27.0 GRAINS PROPELLANT	
107	2701
108	2732
109	2538
110	2653
111	2668
Average	2658
17.0 GRAINS PROPELLANT	
112	1856
113	1802
114	1770
115	1786
116	1766
Average	1796

* Propellant: DuPont No. 4895, Lot No. ALA 2423

PENETRATION TESTS

Complete penetration (C.P.) is the condition which exists when any portion of the core protrudes through the plate, or opens a hole in the rear of the plate which permits the passage of light.

Complete perforation (C.Perf.) is the occurrence wherein a hole has been made in the plate whose diameter clearly indicates passage of the core, or the major part thereof, entirely through and free of the plate.

Failure to penetrate (F.P.) is the condition which exists when the bullet fails to penetrate the plate. Hits in which the bullet struck the plate within three calibers (measured from nearest edge to nearest edge) of either the edge of the plate or of an indent or crack made by a previous bullet were disregarded.

PENETRATION TEST

CARTRIDGE: Ball, Caliber .30, Duplex
RIFLE: U.S., Caliber .30, M1, Modified, Serial No. 5973453
PLATE: Steel, homogeneous, 1/4 x 18 x 36-inch.
B.H.N. 363 to 388
DATE: 14 May 1957
TEMPERATURE: Range 74°F. Ammunition 74°F Density 0.988
RANGE: 100 yards

RD NO.	CHARACTER OF PENETRATION	
	1st Projectile	2nd Projectile
1	Missed Plate	F.P.
2	F.P.	F.P.
3	F.P.	F.P.
4	F.P.	F.P.
5	F.P.	F.P.

PENETRATION TEST

CARTRIDGE: Ball, Caliber .30, Triplex
RIFLE: U.S., Caliber .30, M1, Modified, Serial No. 5973453
PLATE: Steel, homogeneous, 1/4 x 18 x 36-inch
B.H.N. 363 to 388
DATE: 14 May 1957
TEMPERATURE: Range 74°F Ammunition 74°F Density 0.985 to 0.988
RANGE: 100 yards

RD NO.	CHARACTER OF PENETRATION	
	1st Projectile	2nd or 3rd Projectile
1	Missed Plate	F.P.
2	Missed Plate	F.P.
3	Missed Plate	F.P.
4	Missed Plate	F.P.
5	Missed Plate	F.P.

CARTRIDGE: Caliber .22, Loaded with 50-Grain Full Patch Front Bullet for Caliber .22-06 Duplex Cartridge and 37.0 Grains of IMR 4895 Propellant, Lot AIA 2423
RIFLE: Code E, M70, Serial No. 364827 with Caliber .22 Test Barrel
PLATE: Steel homogeneous, 1/4 x 18 x 36-inch
B.H.N.: 363 to 388
DATE: 5 September 1957
TEMPERATURE: Range 76°F Ammunition 76°F Density 0.986
RANGE: 200 yards

RD NO.	CHARACTER OF PENETRATION
1	C. Perf.
2	F.P.
3	C. Perf.
4	C. Perf.
5	C. Perf.

PENETRATION TEST

CARTRIDGE: Ball, Caliber .22, Carbine
RIFLE: Code E, M70, Serial No. 30A164 with Caliber .22 Test Barrel
PLATE: Steel, homogeneous, 1/4 x 18 x 36-inch
B.H.N.: 363 to 388
DATE: 15 May 1957
TEMPERATURE: Range 74°F Ammunition 74°F Density 0.94
RANGE: 100 yards

RD NO.	CHARACTER OF PENETRATION
1	P.P.
2	P.P.
3	P.P.
4	P.P.
5	P.P.

CARTRIDGE: Ball, Caliber .22, Carbine
RIFLE: Code E, M70, Serial No. 30A164
HELMET: Soldier, Steel, M1 with liner M1-L-1910
DATE: 3 May 1957
TEMPERATURE: Range 55°F Ammunition 55°F Density 1.022 to 1.086
RANGE: 500 yards

FAIR HIT NO.	OBLIQUITY	CHARACTER OF PENETRATION FRONT SIDE OF HELMET
1	15°	P.P.
2	30°	P.P.
3	10°	P.P.
4	15°	P.P.
5	10°	P.P.
6	25°	P.P.

PENETRATION TEST

CARTRIDGE: Ball, Caliber .22, T48
RIFLE: Springfield, M1903, Serial No. 4747051
HELMET: Soldier, Steel, M1 with liner M1-L-1910
DATE: 3 May 1957
TEMPERATURE: Range 54°F Ammunition 54°F Density 1.028
RANGE: 500 yards

FAIR HIT NUMBER	OBLIQUITY	CHARACTER OF PENETRATION			
		FRONT SIDE OF HELMET	FRONT SIDE OF HELMET LINER	REAR SIDE OF HELMET LINER	REAR SIDE OF HELMET
1	50°	C. Perf.	C. Perf.	C. Perf.	C. Perf.
2	30°	C. Perf.	C. Perf.	C. Perf.	C. Perf.
3	55°	C. Perf.	C. Perf.	C. Perf.	C. Perf.
4	60°	C. Perf.	C. Perf.	C. Perf.	C. Perf.
5	35°	C. Perf.	C. Perf.	C. Perf.	C. Perf.
6	85°	C. Perf.	C. Perf.		

CARTRIDGE: Ball, Caliber .22, Carbine
RIFLE: Code E, M70, Serial No. 304164
HELMET: Soldier, Steel, M1 with liner M1-L-1910
DATE: 6 May 1957
TEMPERATURE: Range 63°F Ammunition 63°F Density 1.016
RANGE: 300 yards

FAIR HIT NUMBER	OBLIQUITY	CHARACTER OF PENETRATION			
		FRONT SIDE OF HELMET	FRONT SIDE OF HELMET LINER	REAR SIDE OF HELMET LINER	REAR SIDE OF HELMET
1	15°	C. Perf.	C. Perf.	C. Perf.	F. P.
2	20°	C. Perf.	C. Perf.	C. Perf.	F. P.
3	15°	C. Perf.	C. Perf.	F. P.	
4	15°	C. Perf.	C. Perf.	C. Perf.	F. P.
5	50°	C. Perf.	C. Perf.	F. P.	

PENETRATION TEST

CARTRIDGE: Ball, Caliber .22, Carbine
RIFLE: Code E, M70, Serial No. 304164
HELMET: Soldier, Steel, M1 with liner M1-L-1910
DATE: 6 May 1957
TEMPERATURE: Range 61°F Ammunition 61°F Density 1.017
RANGE: 400 yards

FAIR HIT NUMBER	OBLIQUITY	CHARACTER OF PENETRATION FRONT SIDE OF HELMET
1	25°	F. P.
2	30°	F. P.
3	0°	F. P.
4	20°	F. P.
5	0°	F. P.

CARTRIDGE: Ball, Caliber .30, Duplex
RIFLE: U.S., Caliber .30, M1, Modified, Serial No. 5973453
HELMET: Soldier, steel, M1, with liner, M1-L-1910
DATE: 15 May 1957
TEMPERATURE: Range 76-82°F Ammunition 76-82°F Density 0.964 to 0.975
RANGE: 300 yards

FAIR HIT NUMBER	OBLIQUITY	CHARACTER OF PENETRATION FRONT SIDE OF HELMET	FRONT SIDE OF HELMET LINER	REAR SIDE OF HELMET LINER	REAR SIDE OF HELMET
*1	0°	C. Perf.	C. Perf.	C. Perf.	F. P.
2	20°	F. P.			
3	10°	F. P.			
4	30°	F. P.			
*5	25°	C. Perf.	C. Perf.	C. Perf.	C. P.

* Designates hit made by first projectile.

PENETRATION TEST

CARTRIDGE: Ball, Caliber .30, Duplex
RIFLE: U. S., Caliber .30, M1, Modified, Serial No. 5973453
HELMET: Soldier, steel, M1 with liner M1-L-1910
DATE: 16 May 1957
TEMPERATURE Range 66 to 68°F Ammunition 66 to 68°F Density 1.002 to 1.006

RANGE 400 yards

		CHARACTER OF PENETRATION			
PAIR HIT NUMBER	OBLIQUITY	FRONT SIDE OF HELMET	FRONT SIDE OF HELMET LINER	REAR SIDE OF HELMET LINER	REAR SIDE OF HELMET
*1	25°	F. P.			
*2	0°	C. Perf.	C. Perf.	C. P.	F. P.
3	40°	C. P.	C. P.		
*4	20°	F. P.			
*5	40°	F. P.			

CARTRIDGE: Ball, Caliber .30, Triplex
RIFLE: U. S., Caliber .30, M1, Modified, Serial No. 5973453
HELMET: Soldier, steel, M1 with liner M1-L-1910
DATE: 16 May 1957
TEMPERATURE: Range 65°F Temperature 65°F Density 1.007
RANGE: 100 yards

		CHARACTER OF PENETRATION			
PAIR HIT NUMBER	OBLIQUITY	FRONT SIDE OF HELMET	FRONT SIDE OF HELMET LINER	REAR SIDE OF HELMET LINER	REAR SIDE OF HELMET
1	75°	C. Perf.	C. Perf.	C. Perf.	F. P.
2	30°	C. Perf.	C. Perf.	C. Perf.	C. Perf.
3	60°	C. Perf.	C. Perf.	C. Perf.	C. Perf.
4	20°	C. Perf.	C. Perf.	C. Perf.	C. Perf.
5	10°	C. Perf.	C. Perf.	C. Perf.	C. Perf.
6	50°	C. Perf.	C. Perf.	C. Perf.	C. Perf.
*7	40°	C. Perf.	C. Perf.	C. Perf.	C. Perf.

* Designates hit made by first projectile.

PENETRATION TEST

CARTRIDGE: Ball, Caliber .30, Triplex
RIFLE: U.S., Caliber .30, M1, Modified, Serial No. 5973453
HELMET: Soldier, Steel, M1, with liner M1-L-1910
DATE: 16 May 1957
TEMPERATURE: Range 63°F Ammunition 63°F Density 1.011
RANGE: 200 yards

FAIR HIT NUMBER	OBLIQUITY	CHARACTER OF PENETRATION FRONT SIDE OF HELMET
*1	60°	F. P.
2	40°	F. P.
3	10°	F. P.
4	60°	F. P.
*5	10°	F. P.

* Designates hit made by first projectile.

CARTRIDGE: Ball, Caliber .30, Triplex
RIFLE: U.S., Caliber .30, M1, Modified, Serial No. 5973453
HELMET: Soldier, Steel, M1, with liner M1-L-1910
DATE: 16 May 1957
TEMPERATURE: Range 61°F Ammunition 61°F Density 1.013
RANGE: 300 yards

FAIR HIT NUMBER	OBLIQUITY	CHARACTER OF PENETRATION FRONT SIDE OF HELMET
1	15°	F. P.
2	40°	F. P.
3	0°	F. P.
*4	20°	F. P.
5	35°	F. P.
6	10°	F. P.

* Designates hit made by first projectile.

PENETRATION TEST

CARTRIDGE: Caliber .22, Loaded with 50-Grain Full Patch Front Bullet for Caliber .22-06 Duplex Cartridge and 37.0 Grains of IMR 4895 Propellant, Lot ALA-2423.
RIFLE: Code E, M70, Serial No. 364827 with Caliber .22 Test Barrel.
HELMET: Soldier, Steel, M1 with Liner M1-L-1910
DATE: 5 September 1957
TEMPERATURE: Range 78°F Ammunition 78°F Density 0.983
RANGE: 600 yards

FAIR HIT NUMBER	OBLIQUITY	CHARACTER OF PENETRATION: FRONT SIDE OF HELMET	FRONT SIDE OF HELMET LINER	REAR SIDE OF HELMET LINER
1	20°	F. P.		
2	10°	F. P.		
3	15°	F. P.		
4	0°	C. Perf.	C. Perf.	C. P.
5	0°	F. P		

DATE: 13 August 1957
WEAPON: Shotgun, 12 gage Shell: Flechette, Type L-L1 (AA-32)
AMMUNITION TEMPERATURE: 65 to 68°F
RANGE TEMPERATURE: 65 to 68°F Density 1.005 to 1.009

PENETRATION AT 200 YARDS IN HELMET, SOLDIER, STEEL, M1 WITH LINER M1-L-1910

HIT NO.	SHELL NO.	OBLIQUITY	CHARACTER OF PENETRATION: FRONT SIDE OF HELMET	FRONT SIDE OF HELMET LINER	REAR SIDE OF HELMET LINER
1	1	70°	Slight dent**		
2	1	40°	Slight dent		
3	2	55°	Slight dent		
4	4	0°	C. Perf.	C. Perf	C. P.*
5	5	5°	C. Perf.	C. Perf.	C. P.
6	5	40°	Slight dent		
7	5	65°	Slight dent		

* Projectile did not remain in liner.
** Projectile grazed side of helmet.

PENETRATION TEST

DATE: 5 September 1957
WEAPON: Shotgun, 12 gage. Shell: Flechette, Type L-11
AMMUNITION TEMPERATURE: 78 to 80°F Range Temperature: 78 to 80°F
Density 0.977 to 0.983

PENETRATION AT 300 AND 400 YARDS IN HELMET, SOLDIER, STEEL, M1 WITH LINER M1-L-1910

HIT NO.	OBLIQUITY	CHARACTER OF PENETRATION: FRONT SIDE OF HELMET	FRONT SIDE OF HELMET LINER	REAR SIDE OF HELMET LINER
		PENETRATION AT 300 YARDS		
1	42°	Slight dent		
2	0°	C. P.*	C. P.*	
3	0°	C. Perf.	C. Perf.	C. P.
		PENETRATION AT 400 YARDS		
1	0°	C. P*	C. P.*	
2	30°	Slight dent		
3	25°	Slight dent		

DATE: 6 September 1957
WEAPON: Shotgun, 12 gage. Shell: Flechette, Type L-11 (AA-32)
AMMUNITION TEMPERATURE: 68 to 71°F Range Temperature: 68 to 71°F
Density 0.997 to 1.003

PENETRATION AT 500 YARDS IN HELMET, SOLDIER, STEEL, M1 WITH LINER M1-L-1910

HIT NO.	OBLIQUITY	CHARACTER OF PENETRATION: FRONT SIDE OF HELMET	FRONT SIDE OF HELMET LINER
1	40°	Slight dent	
2	15°	C. P.*	C. P.*
3	30°	Slight dent	
4	20°	Slight dent**	
5	15°	Slight dent**	
6	50°	Slight dent	
7	60°	Slight dent	
8	15°	Slight dent**	
9	30°	Slight dent	

* Projectile remained in helmet and liner.
** Projectile was yawing before it hit helmet.

VELOCITY, PATTERN AND PENETRATION TEST

DATE: 2 August 1957
WEAPON: Shotgun, 12 gage. Shell: Flechette, Type L-11 (AA-32)
AMMUNITION TEMPERATURE: 70°F Range Temperature: 86°F
Density .962 to .964
CHRONOGRAPH TYPE: Counter INITIATOR TYPE: Lanilina

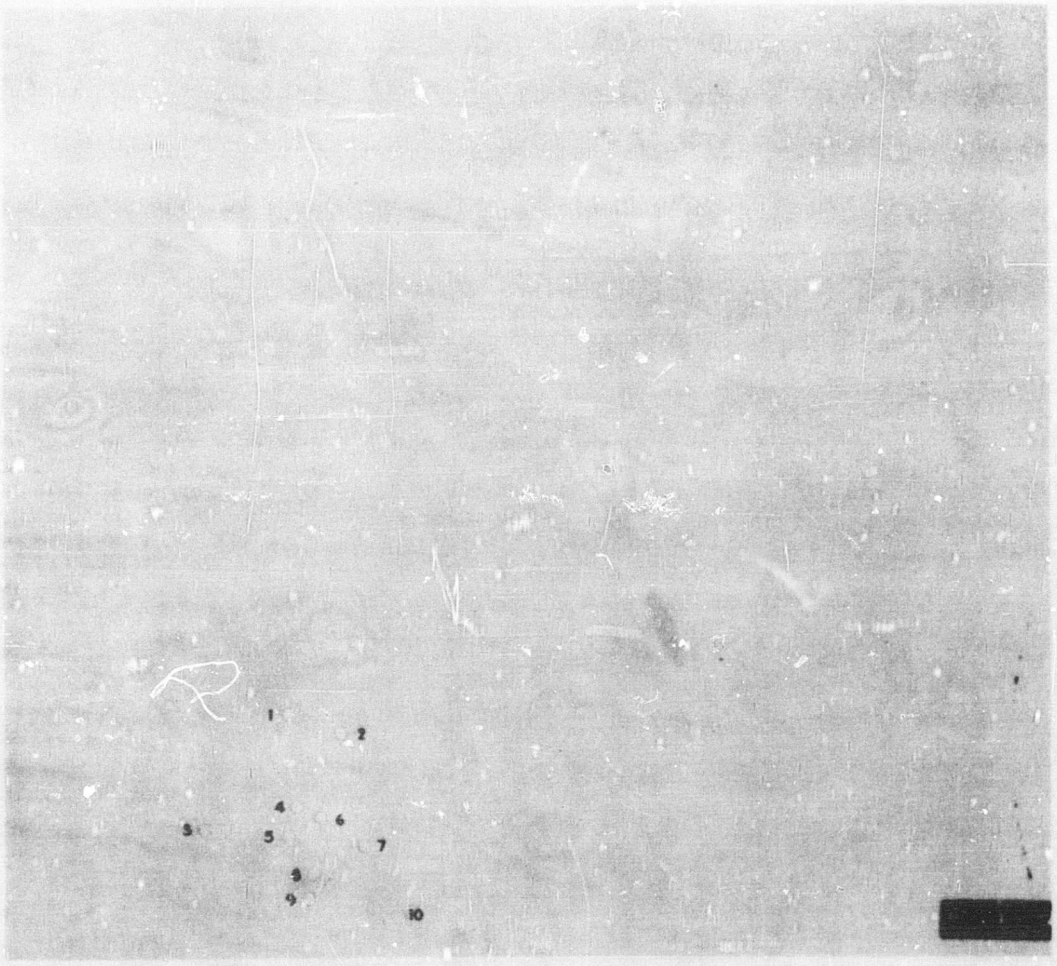
SHELL NO.	VELOCITY AT 7 ft (ft/sec)	PATTERN AT 40 YARDS: NO. HITS IN 60-INCH CIRCLE	NO. HITS IN 30-INCH CIRCLE
1	1220	24 (5 keyholes)	17 (3 keyholes)
2	1316	26 (4 keyholes)	18 (4 keyholes)
3	1227	28 (3 keyholes)	17
4	1302	30 (1 keyhole)	22 (1 keyhole)
5	1241	26	16
6	1264	28 (5 keyholes)	18 (3 keyholes)
7	1205	28 (5 keyholes)	19 (3 keyholes)
8	1272	28 (3 keyholes)	15 (2 keyholes)
9	1258	26 (3 keyholes)	14
10	1280	22 (7 keyholes)	12 (3 keyholes)
Average	1258.5	26.6	16.8

PENETRATION AT 100 YARDS IN HELMET, SOLDIER, STEEL, M1 WITH LINER M1-L-1910

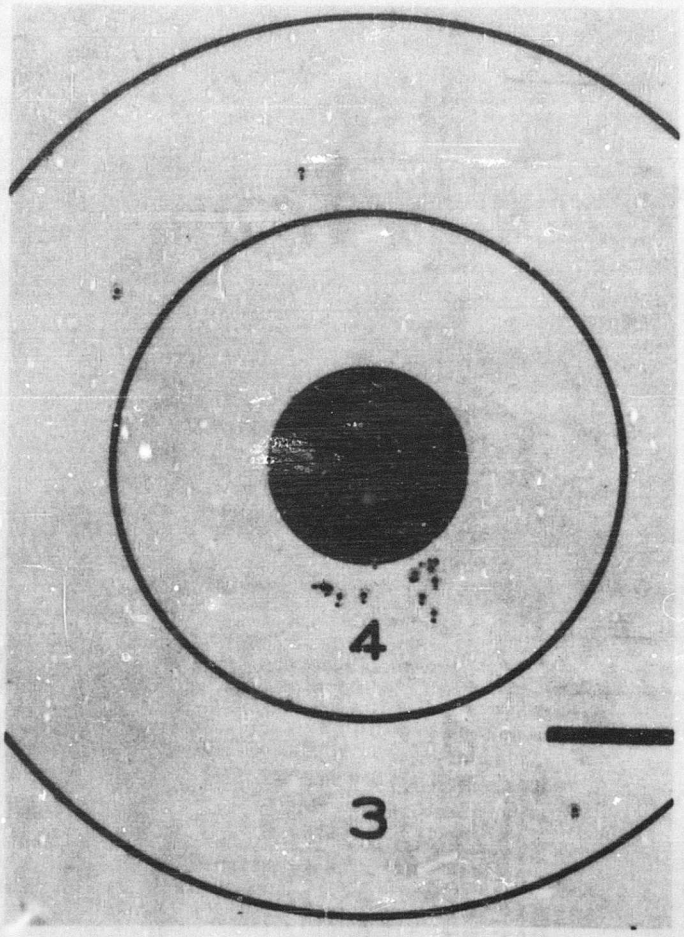
HIT NO.	SHELL NO.	OBLIQUITY	CHARACTER OF PENETRATION: FRONT SIDE OF HELMET	FRONT SIDE OF HELMET LINER	REAR SIDE OF HELMET LINER	REAR SIDE OF HELMET
1	2	15°	C. Perf.	C. Perf	P. P.*	
2	2	5°	C. Perf.	C. Perf	(Projectile stopped in webbing.)	
3	6	40°	Slight dent			
4	6	25°	C. Perf.	C. Perf.	P. P.*	
5	7	20°	C. Perf.	C. Perf.	P. P.*	
6	7	35°	Small dent			
7	7	15°	C. Perf.	C. Perf.	P. P.*	
8	8	15°	C. Perf.	C. Perf.	P. P.*	
9	10	25°	C. Perf.	C. Perf.	P. P.*	
10		45°	Slight dent			
11		65°	Slight dent			

* Projectile did not remain in liner.

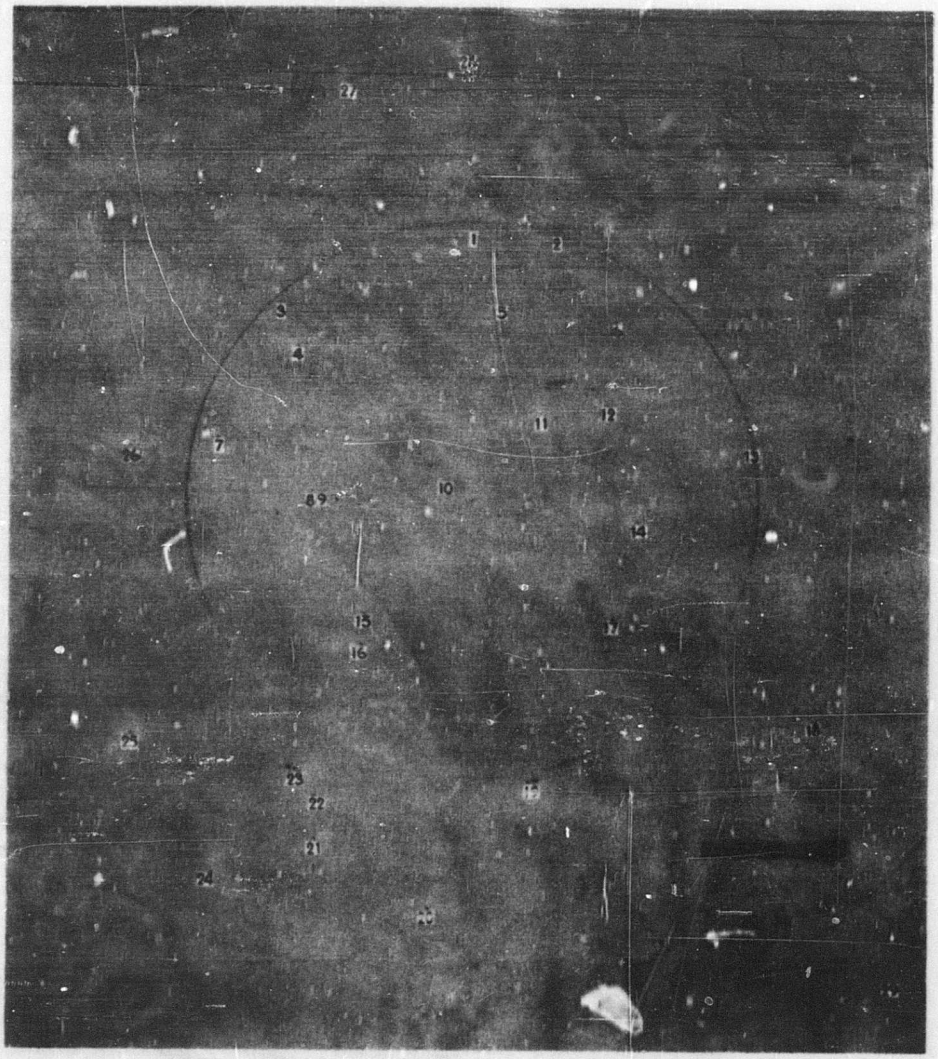
APPENDIX D



B25262 - A ten-round machine-rest target fired at 100 yards, using Cartridge, Ball, Caliber .30, Duplex in Rifle, U.S., Caliber .30, M1, Modified. The numbered shot holes are those made by the first shot in each round.



B26047 - A ten-round target fired from a bench rest at 50 yards using Cartridge, Ball, Caliber .30, Triplex in Rifle, U.S., Caliber .30, M1, Modified. Each shot hole is identified with the round number. The hole made by the first shot in each round is identified with an F.



B26048 - A pattern made at 40 yards with a 12 gage shotgun and flechette ammunition, Type L-L1 (AA-32).

APPENDIX E

DISTRIBUTION

COPY NO.	NAME AND ADDRESS	NO. OF COPIES
1	Chief of Ordnance Department of the Army Washington 25, D. C. ATTN: ORDTS	1
4	Commanding Officer Diamond Ordnance Fuze Laboratory Washington 25, D. C. ATTN: Technical Reference Section	1
5	Commanding Officer Springfield Armory Springfield 1, Massachusetts	1
6	Commanding General Ordnance Weapons Command Rock Island, Illinois ATTN: ORDOW	1
7	Commanding General Frankford Arsenal Philadelphia 37, Pennsylvania ATTN: Pitman-Dunn Lab, Mr. Dickey	1
8	Armed Services Technical Information Agency Document Service Center Knott Building Dayton 2, Ohio ATTN: TICSCP-2	1 vellum
9	Operations Research Office Johns Hopkins University Chevy Chase, Maryland THRU: OCO-ORDTB	1
10-11	Ministry of Supply Staff British Joint Services Mission 1800 K Street, NW Washington 6, D. C. THRU: OCO-ORDGU-SE	2
12-13	Canadian Army Staff 2450 Massachusetts Avenue, NW Washington 8, D. C. ATTN: GSO-1, A&R Section THRU: OCO-ORDGU-SE	2

COPY NO.	NAME AND ADDRESS	NO. OF COPIES
14-15	CONARC Liaison Office Building 305 Aberdeen Proving Ground, Maryland	2
16	Ballistic Research Laboratories Aberdeen Proving Ground, Maryland ATTN: Mr. D. Hall	1
0, 1-2	Technical Library Branch Aberdeen Proving Ground, Maryland	Original 1 Reference 1 Record

CONFIDENTIAL

UNCLASSIFIED